Ontario

Modular Training Standards

Underground Diamond Driller

Program #770150

Ministry of Training,
Colleges and Universities

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Ministry of Training,
Colleges and Universities

Modular Training Standards

Underground Diamond Driller

Program #770150

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This document is the property of the trainee/ employee named inside and represents the official record of his/her training.

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COMPETENCY ANALYSIS PROFILE
Underground Diamond Driller

(All unshaded skill sets must be demonstrated/completed.)

SKILL SETS	***SKILLS***				
FOLLOW SURFACE AND UNDERGROUND INDUCTION PROCEDURES **0000.00**	Identify surface areas 0000.01	Identify underground areas 0000.02	Respond to surface and underground emergencies 0000.03	Apply company policies 0000.04	Comply with union contracts and joint health and safety policy 0000.05
	Operate communication systems 0000.06	Identify on-site explosive types 0000.07	Review multi-channel radio use 0000.08		
PERFORM GENERAL INSPECTIONS **0001.00**	Wear, adjust, and maintain personal protective equipment 0001.01	Erect safety signs 0001.02	Operate fire extinguishers 0001.03	Maintain ventilation flow 0001.04	Operate hand and power tools 0001.05
	Lock out and/or tag mobile and fixed equipment 0001.06	Perform emergency evacuation 0001.07	Identify and report water in chutes and hang-ups 0001.08	Practise good housekeeping in the workplace 0001.09	
SCALE LOOSE ROCK **0002.00**	Identify and respond to rock noises and loose and abnormal ground conditions 0002.01	Identify and respond to faulty ground support 0002.02	Identify and respond to workplace hazards 0002.03	Inspect and prepare rock for scaling 0002.04	Scale rock using a scaling bar for the specific job, based on length, metal type, size, and condition 0002.05

READ AND INTERPRET LAYOUT(S) **0244.00**	Recognize standard symbols, plans, section line(s), and construction drawings 0244.01	Use layout measuring and reference devices 0244.02	Communicate the current status of layout information to others, as required 0244.03	Verify drilling specifications 0244.04	Identify/respond to safety notices 0244.05

OPERATE HAND AND POWER TOOLS **0233.00**	Inspect hand tools 0233.01	Operate hand tools 0233.02	Maintain and store hand tools 0233.03	Inspect and set up electrically powered hand tools 0233.04	Maintain and store electrically powered hand tools 0233.05
	Inspect and set up pneumatic and/or hydraulic hand tools 0233.06	Maintain and store pneumatic and/or hydraulic hand tools 0233.07			

OPERATE MOBILE EQUIPMENT TRACK **0239.00**	Identify and respond to workplace hazards 0239.01	Inspect workplace and scale loose rock 0239.02	Perform pre-operational checks on motor 0239.03	Start up motor 0239.04	Conduct operational checks without load 0239.05
	Operate motor without load 0239.06	Operate motor with load 0239.07	Re-rail motor/cars 0239.08	Couple and uncouple cars/motor 0239.09	Shut down motor 0239.10

OPERATE UTILITY VEHICLE **0024.00**	Identify and respond to workplace hazards 0024.01	Inspect workplace and scale loose rock 0024.02	Perform pre-operational checks on utility vehicle 0024.03	Start up utility vehicle 0024.04	Conduct operational checks on utility vehicle 0024.05
	Operate utility vehicle 0024.06	Shut down utility vehicle 0024.07			

EXTEND SERVICES **0011.00**	Identify and respond to workplace hazards 0011.01	Inspect workplace and scale loose rock 0011.02	Operate lifting mechanism(s) 0011.03	Install pipe, ventilation, power cable, and communication line/cable supports using materials 0011.04	Lock out and/or tag services 0011.05
	Install pipelines, ventilation, communication lines/cable, and power cable using tools and materials 0011.06	Reactivate air, water, and auxiliary ventilation 0011.07	Tear down, move, and store tools and equipment in designated/ approved areas 0011.08		

OPERATE JACKLEG/ STOPER/ PLUGGER **0240.00**	Identify and respond to workplace hazards 0240.01	Inspect workplace and scale loose rock 0240.02	Extend services 0240.03	Prepare face for drilling 0240.04	Set up drills 0240.05
	Perform pre-operational checks on stoper drill components, with controls in the off position and air and water header open 0240.06	Perform pre-operational checks on jackleg drill components, with controls in the off position and air and water header open 0240.07	Perform pre-operational checks on plugger components, with controls in the off position and air and water header open 0240.08	Operate drill 0240.09	Maintain drill and attachments 0240.10
	Install rock bolts 0240.11	Tear down and store drill 0240.12			

SET UP WOODEN STAGING **0003.00**	Identify and respond to workplace hazards 0003.01	Inspect and prepare workplace for scaling 0003.02	Plan and organize worksite 0003.03	Construct and erect wooden staging and ladders 0003.04	Tear down, move, and store wooden staging 0003.05

SET UP PRE-CONSTRUCTED STAGING **0003A.00**	Identify and respond to workplace hazards 0003A.01	Inspect and prepare workplace for scaling 0003A.02	Lock out and/or tag fixed equipment 0003A.03	Perform equipment pre-operational check on staging 0003A.04	Place and set up pre-constructed staging 0003A.05
	Erect standard ladders 0003A.06	Tear down and store pre-constructed staging 0003A.07			

SET UP MECHANICAL STAGING **0003B.00**	Identify and respond to workplace hazards 0003B.01	Inspect and prepare workplace for scaling 0003B.02	Perform equipment pre-operational check on mechanical staging 0003B.03	Operate mechanical staging 0003B.04	Perform shut-down on mechanical staging 0003B.05

MOVE DRILL AND EQUIPMENT **0245.00**	Read layout 0245.01	Plan move prior to mobilizing 0245.02	Determine moving method 0245.03	Secure loads, using appropriate methods and equipment 0245.04	Store drill and equipment in a designated area 0245.05

SET UP DRILL **0246.00**	Identify and respond to workplace hazards 0246.01	Inspect and prepare workplace for scaling 0246.02	Read layout 0246.03	Plan and organize workplace 0246.04	Extend services 0246.05
	Set up lighting 0246.06	Operate lifting mechanisms 0246.07	Line up and level drill 0246.08	Install anchor(s) for drill 0246.09	Set up staging 0246.10
	Install rod racks 0246.11	Install safety devices 0246.12	Set up water pump(s) 0246.13	Connect air/water services to drill equipment 0246.14	Connect hydraulic hoses to drill equipment 0246.15

	Set up safety barriers 0246.16				

MAINTAIN DRILLING EQUIPMENT **0247.00**	Perform pre-operational checks on drill, with controls in neutral position 0247.01	Conduct operational checks on drill 0247.02	Perform emergency shutdown 0247.03	Maintain fluid levels and lubricate grease points on drill components 0247.04	Monitor system components 0247.05
	Maintain wire line hoist and components 0247.06	Maintain in the hole tools 0247.07	Maintain water pump 0247.08	Lock out and/or tag drill equipment for repair and maintenance 0247.09	

HANDLE CORE **0237.00**	Empty core tube 0237.01	Place core in core box 0237.02	Secure and identify core box(es) for transportation 0237.03	Prepare and maintain core tube assembly 0237.04	

TEAR DOWN DIAMOND DRILL AND EQUIPMENT **0248.00**	Disconnect drill from anchor(s) and/or remove anchor(s) 0248.01	Operate lifting mechanisms 0248.02	Disconnect services 0248.03	Package drill and equipment 0248.04	Tear down, move, and store dismantled staging and equipment in pre-assigned area using designated mobile equipment 0248.05
	Tear down safety barriers 0248.06				

OPERATE LIFTING MECHANISM(S) **0013.00**	Identify and respond to workplace hazards 0013.01	Inspect workplace and scale loose rock 0013.02	Perform pre-operational checks on lifting mechanism(s) 0013.03	Operate lifting mechanisms 0013.04	Select and use slinging equipment 0013.05
	Raise and lower materials/equipment using lifting mechanism(s) 0013.06	Shut down lifting mechanism(s) 0013.07			

OPERATE DIAMOND DRILL **0243.00**	Identify and respond to workplace hazards 0243.01	Inspect workplace and scale loose rock 0243.02	Check for adequate oxygen levels and the presence of hazardous gases 0243.03	Read logbook, before operating drill, taking corrective actions for any discrepancies at the drill site or abnormalities in the drill hole 0243.04	Read layout 0243.05
	Check drill alignment 0243.06	Perform pre-operational checks on drill, with controls in neutral position 0243.07	Start up drill 0243.08	Conduct operational checks on drill 0243.09	Drill hole to a predetermined depth 0243.10
	Pull inner tube from drill hole 0243.11	Identify in-hole condition 0243.12	Test hole according to layout, using required instruments to provide information 0243.13	Hoist and lower rods, as required 0243.14	Plug drill hole, when required 0243.15
	Mark holes 0243.16	Shut down drill 0243.17			

GROUT DIAMOND DRILL HOLES **0249.00**	Identify and respond to workplace hazards 0249.01	Inspect workplace and scale loose rock 0249.02	Read layout 0249.03	Select grouting equipment 0249.04	Perform pre-operational checks on grouting equipment, with controls in neutral position 0249.05
	Start up grouting equipment 0249.06	Conduct operational checks on grouting equipment 0249.07	Perform grouting 0249.08	Maintain grouting equipment 0249.09	Tear down and store grouting equipment 0249.10

PREFACE

This training document was developed by the Program Development and Standards Unit of the Ministry of Training, Colleges and Universities, in consultation with representatives from the industry. These Training Standards are intended to be used by trainees, trainers/instructors, and companies as a "blueprint" for training or as a prerequisite for government accreditation/ certification. Although this training document is intended as a guideline for training, all issues might not apply in all operations.

An Underground Diamond Driller is a worker who has achieved accreditation in the entire Common Core Program #770150. The employer must provide training to the worker in the entire Common Core for the Underground Diamond Driller Training Program within the first year of employment. And the appropriate Common Core modules related to a specialty module must be taken before training in the specialty module (i.e., Grouting Holes).

To be accredited in the Common Core for Program #770150, the trainee must have demonstrated competency in each of the following modules:

Helper Level

- 0000, 0001, and 0002
- One of 0003, 003A, or 003B
- 0244, 0233, 0239 or 0024, 0011, 0240, 0245, 0246, 0247, 0237, 0248 and 0013

Runner Level

- Helper Level Modules and 0243

Specialty Module

- 0249

- The first three modules of the Common Core Program #770150, Follow Surface and Underground Induction Procedures, 0000; Perform General Inspections, 0001; and Scale Loose Rock, 0002, must be completed before all other modules in Program #770150;

- The appropriate Common Core modules for Program #770150 related to a Specialty module must be completed before training in the Specialty module is done;

- Modules/areas of this Common Core may incorporate some Specialty modules for the purposes of safety and technological changes. However, accreditation in these areas of the Common Core is not intended to replace accreditation in the Specialty modules;

- Workers must be trained and accredited in government-recognized Specialty Modules in areas that are part of their job responsibilities;

- The first three modules of the Common Core Program #770150, Follow Surface and Underground Induction Procedures, 0000; Perform General Inspections, 0001; and Scale Loose Rock, 0002, have been "pulled out" to establish a separate modular program for service types who work underground. This new program is the Basic Underground Hard Rock Mine Service Types – Common Core, Program #770225;

- Service types include tradespersons, geologists, warehouse workers, ground control, and specialists/engineers.

- The employer must provide the worker with the entire Common Core Program for Underground Diamond Driller, #770150, within the first year of his or her employment. The employer has a responsibility to train workers for the work to be done (e.g., Mechanical Staging for a geologist).

The first three modules, 0000 through 0002, are prerequisites for all other modules. They must be completed before any other modules can be done and before the employee can be permitted to work underground. Once these first three modules have been successfully completed, the order in which the other modules are trained is flexible and can vary.

New trainees or experienced diamond drillers must obtain accreditation in the same way. Each must demonstrate the skills specified in each Performance Objective to the described minimal acceptable standard as prescribed in each module. These demonstrations must be administered in an operating mine by a designated employee of the company who shall follow the Performance Demonstration Guidelines approved by the Mining Tripartite Committee.

The care and maintenance of this book is the joint responsibility of the trainee and the employer. The Training Standards were developed specifically for documenting the trainee's acquisition of skills.

Throughout the document, the term *including* is often used. Including means one or more of the items listed, but it is not limited to those items included in the list.

IMPORTANT DIRECTIONS TO TRAINERS

Trainers instructing workers in this Common Core Program must themselves be accredited in the Underground Diamond Driller Common Core Program #770150.

The Training Standards identify skills required for this occupation and its related training program.

These Training Standards have been written in concise statements that describe how well a trainee must perform each skill in order to become competent.

By using these Training Standards, trainers will be able to ensure that the trainee is developing the skills detailed for the occupation.

Trainers and trainees are required to sign off on and date the skills following each successful acquisition.

Employers participating in this training program will be designated as the Signing Authority and are required to attest to the successful achievement in the space provided at the end of each unit.

LIST OF MINING PROGRAMS

- P770010 Common Core Basic Underground Hard Rock Miner
- P770010 Speciality Modules Program for Underground Hard Rock Mining
- P770120 Common Core First Line Production Supervisor – Underground Hard Rock Mining
- P810050 Common Core for Basic Mills Process Operations – Mineral Ore
- P810050 Speciality Modules Program for Mill Process Operators – Mineral Ore
- P770150 Underground Diamond Driller
- P770200 Surface Diamond Drilling
- P770130 Common Core Underground Soft Rock Mining Skills
- P770130 Speciality Modules Program – Underground Soft Rock Mining
- P770225 Basic Underground Hard Rock Mine Service Types

COMMITTEES

The Ministry is grateful for the cooperation and contribution of the following committees in the development and maintenance of the Common Core and Specialty Skills Modules Programs.

Review and Development Committee

Labour/Worker Reps:

Arno Sakki	Mine, Mill CAW/Local 598
Doug Olson	United Steel Workers of America, Local 9364
James Niemi	United Steel Workers of America, Local 6500
Mike Fleury	United Steel Workers of America, Local 6500
Moe Durocher	Mine, Mill CAW/Local 598
Randi Condie	United Steel Workers of America, Local 6500

Management Reps:

Andy Attwater	Heath and Sherwood Drilling (1986) Inc.
Bill Krasnozon	Boart Longyear Inc.
Brad Pullen	Heath and Sherwood Drilling (1986) Inc.
Herb Phelps	Falconbridge Limited
Marcel Vaillancourt	Inco Limited
Remi Nolet	Falconbridge Limited
Richard Ross	Inco Limited

Resource Persons:

Abate W. Abate	Ministry of Training, Colleges and Universities
Bernie Deck	Ontario Ministry of Labour
Charles Kennedy	Ontario Ministry of Labour
Michelle Chandler	Ministry of Training, Colleges and Universities

Mining Tripartite Committee

Labour:

Arno Sakki	Mine, Mill CAW/Local 598
Fred Gervais	United Steelworkers of America, Local 6500
James Malcolm	United Steelworkers of America, Local 9422
Jeff Wilcox	United Steelworkers of America, Local 14994
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Donna Kirkpatrick	Falconbridge Ltd.
Doug Osborne	Canadian Salt Ojibway Mine/Southern Safety Association
Doug Turner	Noranda/Falconbridge (Kidd Mining Division)
Steve Drew	Nelson Aggregate Co./Aggregate Producers Association

Resource:

Abate W. Abate	Ministry of Training, Colleges and Universities
Bernie Deck	Ontario Ministry of Labour
Charles Kennedy	Ontario Ministry of Labour
John Blogg	Ontario Mining Association
Michelle Chandler	Ministry of Training, Colleges and Universities

IMPORTANT DIRECTIONS TO THE TRAINEE

Trainee

1. All hours working for each employer(s) must be recorded in the Employer Information section.

2. It is the responsibility of the trainee to inform the local Apprenticeship Client Services office regarding the following changes:

   - change of trainee name or address
   - transfer to a new employer

3. Training Reports must be signed for modular trainees by a Ministry of Training, Colleges and Universities designated Signing Authority and forwarded to a local Apprenticeship Client Services office.

4. At the completion of training, the Trainee Completion Form must be completed, signed off on by the Signing Authority, and submitted to local Apprenticeship Client Services office.

NOTICE/DECLARATION FOR COLLECTION OF PERSONAL INFORMATION

1. This information is collected under the authority of the Order-In-Council Number 701/85.

2. The information is collected for the purpose of administering this modular training program within the Province of Ontario.

3. Questions regarding collection and use of this information may be directed to:

Director of Apprenticeship
Workplace Training Branch
Ministry of Training, Colleges and Universities
17th Floor, Mowat Block
900 Bay Street
Toronto, ON M7A 1L2
(416) 326-5605

TRAINEE RECORD

Trainee Name: _____

Contract Number: _____
(If applicable)

EMPLOYER INFORMATION

Company: _____

Address: _____

_____

Telephone: _____

EMPLOYER INFORMATION

Company: _____

Address: _____

_____

Telephone: _____

EMPLOYER INFORMATION

Company: _____

Address: _____

_____

Telephone: _____

EMPLOYER INFORMATION

Company: _____

Address: _____

_____

Telephone: _____

EMPLOYER INFORMATION

Company: _____

Address: _____

_____

Telephone: _____

TRAINEE COMPLETION FORM

Trainee Name _____
Print

_____
Signature

Social Insurance Number _____

Training Units, when completed, should be signed off on by the Trainer/Signing Authority on the following page and presented with this completion form to your local Apprenticeship Client Services office. Any supporting documentation should also be attached.

Employer Name: _____

Address: _____

Telephone: _____

Signing Authority: _____
Signature

MTCU USE ONLY:

Recommended for Exam: Yes ( ) No ( ) N/A ( )

_____ _____
Signature Consultant/Office Code

TRAINING UNIT COMPLETION FORM

TRAINING UNITS	TITLE	SIGNING AUTHORITY
0000	Follow Surface and Underground Induction Procedures	_____
0001	Perform General Inspections	_____
0002	Scale Loose Rock	_____
0244	Read and Interpret Layout(s)	_____
0233	Operate Hand and Power Tools	_____
0239	Operate Mobile Equipment Track	_____
0024	Operate Utility Vehicle	_____
0011	Extend Services	_____
0240	Operate Jackleg/Stoper/Plugger	_____
0003	Set Up Wooden Staging	_____
0003A	Set Up Pre-constructed Staging	_____
0003B	Set Up Mechanical Staging	_____
0245	Move Drill and Equipment	_____
0246	Set Up Drill	_____
0247	Maintain Drilling Equipment	_____
0237	Handle Core	_____
0248	Tear Down Diamond Drill and Equipment	_____
0013	Operate Lifting Mechanisms	_____
0243	Operate Diamond Drill	_____
0249	Grout Diamond Drill Holes	_____

SKILL SET COMPLETION FORM

SKILLS SETS	TITLE	SIGNING AUTHORITY
0000.00	FOLLOW SURFACE AND UNDERGROUND INDUCTION PROCEDURES	
0001.00	PERFORM GENERAL INSPECTIONS	
0002.00	SCALE LOOSE ROCK	
0244.00	READ AND INTERPRET LAYOUT(S)	
0233.00	OPERATE HAND AND POWER TOOLS	
0239.00	OPERATE MOBILE EQUIPMENT TRACK	
0024.00	OPERATE UTILITY VEHICLE	
0011.00	EXTEND SERVICES	
0240.00	OPERATE JACKLEG/STOPER/PLUGGER	
0003.00	SET UP WOODEN STAGING	
0003A.00	SET UP PRE-CONSTRUCTED STAGING	
0003B.00	SET UP MECHANICAL STAGING	
0245.00	MOVE DRILL AND EQUIPMENT	
0246.00	SET UP DRILL	
0247.00	MAINTAIN DRILLING EQUIPMENT	

0237.00	**HANDLE CORE**	
0248.00	**TEAR DOWN DIAMOND DRILL AND EQUIPMENT**	
0013.00	**OPERATE LIFTING MECHANISM(S)**	
0243.00	**OPERATE DIAMOND DRILL**	
0249.00	**GROUT DIAMOND DRILL HOLES**	

NOTE ON SHADED PERFORMANCE OBJECTIVES AND SKILLS

- Shaded performance objectives and skill sets are optional. The shaded skills do not have to be demonstrated or signed off on for completion of the on-the-job component of the apprenticeship.
- The in-school curriculum learning outcomes will cover all the skill sets, both shaded and unshaded.
- The Certificate of Qualification examination will test the whole of the trade and may test both shaded and unshaded performance skill sets.

0000.00 FOLLOW SURFACE AND UNDERGROUND INDUCTION PROCEDURES

GENERAL PERFORMANCE OBJECTIVE

Follow surface and underground induction procedures by identifying surface and underground areas; responding to emergencies; applying company policies, union contracts, and joint health and safety policy; operating communication systems; identifying on-site explosive types and following related handling procedures; and reviewing multi-channel radio use.

PERFORMANCE OBJECTIVES

SKILLS

0000.01 **Identify surface areas,** including security, First Aid, Health and Safety Office, Hoist Room, Warehouse, Material Safety Data Sheets, Permit Stations, Engineering Offices, Union Office, Central Control Room, Accounting and Payroll, Supervisor Area, *Occupational Health and Safety Act* location, Wickets, Lamp Room, Tag In and Out Boards, and Stench Injection location, to ensure familiarity with surface layout, according to company standards.

Signatures of:

_____	_____	_____
Date Completed	Trainee	Supervisor/Trainer

0000.00 FOLLOW SURFACE AND UNDERGROUND INDUCTION PROCEDURES (cont.)

0000.02 Identify underground areas, including tramming/travel routes; ramp layouts; traffic controls; escape ways; manways; shaft stations; substations; refuge stations; battery-charging stations; ore and waste pass systems; backfill systems; cage call systems; central blast systems; communication systems; air, water, and power rooms; lunch rooms; switch rooms; shops; fuel, wash, and safety bays; garages; fire and ventilation doors; ventilation control boards; material storage; powder and cap magazine storage; tire storage; and specific worksites, to ensure familiarity with underground locations and systems according to company standards.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0000.03 Respond to surface and underground emergencies, including fires, by following procedures, including identifying escape ways, evacuation routes, fire doors, designated smoking areas, and stench gas; reporting check in and check out, accidents, injuries, and absences; wearing protective clothing and cap lamps; observing shift schedules and fire regulations; and following cage loading and conduct guidelines, to ensure the safety of self and others according to government legislation and company standards.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0000.00 FOLLOW SURFACE AND UNDERGROUND INDUCTION PROCEDURES (cont.)

0000.04 **Apply company policies,** including sexual harassment, discipline, written procedures, tagging in and out, working alone procedures, and locating manuals according to government legislation and company standards.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0000.05 **Comply with union contracts and joint health and safety policy,** by identifying union, worker, and health and safety representatives, and by indicating the location of their offices according to the collective agreement, government legislation, and company standards.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0000.06 **Operate communication systems,** including pager phones, multi-channel radios, cage call systems, telephones, fax machines, e-mail, inter-plant mail, bulletin boards, safety signs, information boards, and newsletters, by identifying location and operating to convey and obtain information according to company standards and manufacturer specifications.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0000.00 FOLLOW SURFACE AND UNDERGROUND INDUCTION PROCEDURES (cont.)

0000.07 **Identify on-site explosive types** and follow related handling procedures, according to government legislation, company standards, and manufacturer specifications.

Signatures of:

_____	_____	_____
Date Completed	Trainee	Supervisor/Trainer

0000.08 **Review multi-channel radio use** in the presence of explosives, according to government legislation, company standards, and manufacturers' specifications.

Signatures of:

_____	_____	_____
Date Completed	Trainee	Supervisor/Trainer

0001.00 PERFORM GENERAL INSPECTIONS

GENERAL PERFORMANCE OBJECTIVE

Perform general inspections by wearing, adjusting, and maintaining personal protective equipment; erecting safety signs; operating fire extinguishers; maintaining ventilation flow; operating hand and power tools; locking out and/or tagging mobile and fixed equipment; performing emergency evacuation; identifying and reporting water in chutes and hang-ups; and practising good housekeeping.

PERFORMANCE OBJECTIVES

SKILLS

0001.01 **Wear, adjust, and maintain personal protective equipment,** including eye, hand, foot, head, ear, lung, skin and body, and fall-arrest system, to ensure optimum fit and protection to the wearer for the task being performed, according to government legislation, company standards, and manufacturers' specifications.

Signatures of:

_____	_____	_____
Date Completed	Trainee	Supervisor/Trainer

0001.02 **Erect safety signs,** including information, direction, cautionary, and danger, by identifying hazards and isolating the area to prevent personal injury and inform employees of potential hazards, according to government legislation and company standards.

Signatures of:

_____	_____	_____
Date Completed	Trainee	Supervisor/Trainer

0001.00 PERFORM GENERAL INSPECTIONS (cont.)

0001.03 **Operate fire extinguishers,** including A, B, C, and ABC units, to control and/or put out fires, including paper, wood, trash, flammable liquids, lubricants, paints, and electrical, according to government legislation and company standards.

Signatures of:

_____	_____	_____
Date Completed	Trainee	Supervisor/Trainer

0001.04 **Maintain ventilation flow** when operating underground mine by inspecting airflow, identifying location of doors and barricades, adhering to instructions and markings posted on doors, and repairing and/or reporting deficiencies, according to government legislation and company standards.

Signatures of:

_____	_____	_____
Date Completed	Trainee	Supervisor/Trainer

0001.05 **Operate hand and power tools,** including axes, wrenches, picks, shovels, scaling bars, chainsaws, air tools, and drills, so that the tool selected is suitable for the job, in good condition, and has guards in place so that no damage results to the worker or the tool, according to government legislation and company standards.

Signatures of:

_____	_____	_____
Date Completed	Trainee	Supervisor/Trainer

0001.00 PERFORM GENERAL INSPECTIONS (cont.)

0001.06 **Lock out and/or tag mobile and fixed equipment,** including conveyors, chutes, loading pockets, crushers, scoop trams, load haul dump (LHD) machines, and drill rigs, for repair and maintenance by shutting down the equipment and reporting deficiencies, according to government legislation and company standards.

Signatures of:

_____	_____	_____
Date Completed	Trainee	Supervisor/Trainer

0001.07 **Perform emergency evacuation** by being aware of refuge stations, fire and emergency procedures, escape way locations, routes, and markings, to ensure safety of self and others, according to government legislation and company standards.

Signatures of:

_____	_____	_____
Date Completed	Trainee	Supervisor/Trainer

0001.08 **Identify and report water in chutes and hang-ups** by performing visual inspection, reporting deficiencies, and performing repairs, including diverting water and/or shutting off water hoses, according to government legislation and company standards.

Signatures of:

_____	_____	_____
Date Completed	Trainee	Supervisor/Trainer

0001.00 PERFORM GENERAL INSPECTIONS (cont.)

0001.09 **Practise good housekeeping in the workplace** by cleaning up spills and/or leaks, maintaining a clean work area free of obstructions, and storing tools and equipment to minimize accident or injury to self and others, according to government legislation and company standards.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0002.00 SCALE LOOSE ROCK

GENERAL PERFORMANCE OBJECTIVE

Scale loose rock by identifying and responding to loose and abnormal ground conditions, identifying and responding to faulty ground support, identifying and responding to workplace hazards, inspecting and preparing the rock for scaling, and scaling rock.

PERFORMANCE OBJECTIVES

SKILLS

0002.01 **Identify and respond to rock noises and loose and abnormal ground conditions,** including faults, slips, dykes, jointing, and contacts, by washing down the area, conducting visual and sounding inspections, sounding and scaling with a properly selected scaling bar, isolating the area, and reporting deficiencies, according to government legislation and company standards.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0002.02 **Identify and respond to faulty ground support,** including deformed plates, cracked cement, rock filled and/or broken screens, cracked timber, dry rot, spalling, and snapping/shredding bolts, by washing down the area, conducting visual and sounding inspections, listening for rock noises, isolating the area, and reporting deficiencies, according to government legislation and company standards.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0002.00 SCALE LOOSE ROCK (cont.)

0002.03 Identify and respond to workplace hazards, including ground conditions, ventilation, open holes above/below, and housekeeping, by isolating the area and repairing and/or reporting deficiencies, according to government legislation and company standards.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0002.04 Inspect and prepare rock for scaling by selecting scaling bar for the specific job based on length, metal type, size, and condition; washing down the face; selecting, repairing, and fastening connecting hoses; setting water flow; and repairing and/or reporting deficiencies, according to government legislation and company standards.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0002.05 Scale rock using a scaling bar for the specific job, based on length, metal type, size, and condition, by reaching, prying, pulling, lifting, thrusting, and sounding with a bar to remove loose rock and to ensure safety of self and others, according to government legislation and company standards.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0244.00 READ AND INTERPRET LAYOUT(S)

GENERAL PERFORMANCE OBJECTIVE

Read and interpret layout(s) by recognizing standard symbols, plans, section lines, and construction drawings; using layout measuring devices; communicating current status of layout information; verifying drilling specifications; and identifying and responding to safety notices. To be trained and accredited in this module, the prerequisite modules are U0000, U0001, and U0002.

PERFORMANCE OBJECTIVES

SKILLS

0244.01 **Recognize standard symbols, plans, section line(s), and construction drawings,** to ensure work progresses in a safe manner, according to government legislation and company standards.

Signatures of:

_____	_____	_____
Date Completed	Trainee	Supervisor/Trainer

0244.02 **Use layout measuring and reference devices,** including scales, lasers, tapes, plumb lines, protractors, levels, and rulers, to verify work is progressing according to plans and specifications and following reporting procedures, according to company standards.

Signatures of:

_____	_____	_____
Date Completed	Trainee	Supervisor/Trainer

0244.00 READ AND INTERPRET LAYOUT(S) (cont.)

0244.03 **Communicate the current status of layout information to others, as required,** including workers, engineers/geologists, and supervisors, to keep all informed of the current status of drilling production work, following reporting procedures, according to government legislation and company standards.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0244.04 **Verify drilling specifications,** including hole location, depth, size, azimuth, and inclination, according to layout and following reporting procedures, according to government legislation and company standards.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0244.05 **Identify/respond to safety notices,** including hazardous gases, breakthroughs, remote drilling areas, geological structures, high water pressure, and flow, by guarding, communicating, and monitoring according to government legislation and company standards.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0233.00 OPERATE HAND AND POWER TOOLS

GENERAL PERFORMANCE OBJECTIVE

Operate hand and power tools by inspecting hand tools, operating hand tools, maintaining and storing hand tools, inspecting and setting up electrical power hand tools, operating electrical power tools, maintaining and storing electrical power tools, inspecting and setting up pneumatic and/or hydraulic hand tools, operating pneumatic and/or hydraulic hand tools, and maintaining and storing pneumatic and/or hydraulic hand tools.

PERFORMANCE OBJECTIVES

SKILLS

0233.01 **Inspect hand tools,** including pipe wrench, tube wrench, hammer, screwdriver, and attachments, by checking tools for damage, hazards, and general condition to protect self and others, according to government legislation, company standards, and manufacturers' specifications.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0233.02 **Operate hand tools**, electrically powered, pneumatic, and/or hydraulic, by using personnel protective equipment, working from a safe location, securing object to be worked on, and changing attachments as required, according to government legislation, company standards, and manufacturers' specifications.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0233.00 OPERATE HAND AND POWER TOOLS (cont.)

0233.03 **Maintain and store hand tools** by inspecting before, during, and after use; cleaning prior to placing in a designated location; and repairing and/or reporting deficiencies, according to government legislation, company standards, and manufacturers' specifications.

Signatures of:

_____	_____	_____
Date Completed	Trainee	Supervisor/Trainer

0233.04 **Inspect and set up electrically powered hand tools,** including grinder, drill, and chainsaw, by checking tools and attachments, including extension cord and plugs, for damage, hazards, and general condition, to protect self and others according to government legislation, company standards, and manufacturers' specifications.

Signatures of:

_____	_____	_____
Date Completed	Trainee	Supervisor/Trainer

0233.05 **Maintain and store electrically powered hand tools,** including attachments and extension cords, by inspecting before, during, and after use; cleaning prior to placing in a designated location; and repairing and/or reporting deficiencies, according to government legislation, company standards, and manufacturers' specifications.

Signatures of:

_____	_____	_____
Date Completed	Trainee	Supervisor/Trainer

0233.00 OPERATE HAND AND POWER TOOLS (cont.)

0233.06 **Inspect and set up pneumatic and/or hydraulic hand tools,** including grinder, chainsaw, drill, impact, ratchet, and attachments, including air hoses and lubricator by checking for damage, hazards, and general condition; locating and connecting hoses and lubricator; verifying air pressure to protect self and others; and repairing and/or reporting deficiencies, according to government legislation, company standards, and manufacturers' specifications.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0233.07 **Maintain and store pneumatic and/or hydraulic hand tools,** including attachments, lubricators, and hoses, by inspecting before, during, and after use; cleaning prior to placing in a designated location; and repairing and/or reporting deficiencies, according to government legislation, company standards, and manufacturers' specifications.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0239.00 OPERATE MOBILE EQUIPMENT TRACK

GENERAL PERFORMANCE OBJECTIVE

Operate mobile equipment track by performing pre-operational checks on motor and start-up motor, conducting pre-operational checks without load, operating motor without load, loading transport and unloading materials/personnel and or supplies, re-railing motor/cars, shutting down, coupling and uncoupling cars/motor, refuelling motor, and charging motor.

PERFORMANCE OBJECTIVES

SKILLS

0239.01 **Identify and respond to workplace hazards,** including poor ground conditions, inadequate ventilation, open holes above/below, and poor housekeeping, by isolating the area to ensure safe working conditions to protect self and others, and by repairing and/or reporting deficiencies, according to government legislation and company standards.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0239.02 **Inspect workplace and scale loose rock** by selecting a scaling bar for the specific job based on length, metal type, size, and condition; washing down area/face as required; selecting, repairing, and fastening connecting hoses; setting water flow; and repairing and/or reporting deficiencies, according to government legislation and company standards.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0239.00 OPERATE MOBILE EQUIPMENT TRACK (cont.)

0239.03 **Perform pre-operational checks on motor** by testing power source; checking fluid levels following refuelling/charging and lubricating procedures; locating principle components, including chassis, engine/power source, lighting, and warning systems; performing visual inspection; locating fire extinguisher; inspecting braking system; locking out and/or tagging; using three-point contact while mounting and dismounting; and repairing and/or reporting deficiencies, according to government legislation, company standards, and manufacturers' specifications.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0239.04 **Start up motor** by activating power source, using audible warning systems, observing equipment operation and gauges, checking clearances and activity in area, locking out and/or tagging, and repairing and/or reporting deficiencies, according to government legislation, company standards, and manufacturers' specifications.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0239.05 **Conduct operational checks without load** by monitoring gauges and meters, including oil, temperature, and alternator output; listening for unusual noises in engine/power train; inspecting/testing braking systems; inspecting deadman switch; locking out and/or tagging; and repairing and/or reporting deficiencies, according to government legislation, company standards, and manufacturers' specifications.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0239.00 **OPERATE MOBILE EQUIPMENT TRACK** (cont.)

0239.06 **Operate motor without load** by complying with traffic signs, signals, and speed limits; ensuring adequate clearance; ensuring proper position of fire/ventilation doors; leaving switches in required position; locking out and/or tagging; and repairing and/or reporting deficiencies, ensuring safety of self and others according to government legislation, company standards, and manufacturers' specifications.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0239.07 **Operate motor with load** by complying with traffic signs, signals, speed limits, and right of way; ensuring adequate clearance; ensuring non-movement of motor/cars during loading and unloading of personnel/material; securing loads; ensuring proper position of fire/ventilation doors; leaving switches in required position; locking out and/or tagging; and repairing and/or reporting deficiencies, ensuring safety of self and others according to government legislation, company standards, and manufacturers' specifications.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0239.08 **Re-rail motor/cars** by placing signs, barricades, and/or guards; isolating power supply; using re-railers, including hydraulic/mechanical jacks or chain blocks; ensuring safety of self and others according to government legislation, company standards, and manufacturer specifications.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0239.00 **`OPERATE MOBILE EQUIPMENT TRACK** (cont.)

0239.09 **Couple and uncouple cars/motor** using appropriate communication, couplings, pins, draw bars, and blocking chains, and ensuring safety of self and others according to government legislation, company standards, and manufacturers' specifications.

Signatures of:

_____	_____	_____
Date Completed	Trainee	Supervisor/Trainer

0239.10 **Shut down motor** by parking in the designated area, applying park brake, deactivating power supply, completing operator's report, and repairing and/or reporting deficiencies, according to government legislation, company standards, and manufacturers' specifications.

Signatures of:

_____	_____	_____
Date Completed	Trainee	Supervisor/Trainer

0024.00 OPERATE UTILITY VEHICLE

GENERAL PERFORMANCE OBJECTIVE

Operate utility vehicle to transport materials and/or personnel by responding to workplace hazards, inspecting and scaling workplace, performing pre-operational checks on utility vehicle, starting up utility vehicle, conducting operational checks on utility vehicle, operating utility vehicle, and shutting down utility vehicle, according to government legislation, company standards, and manufacturers' specifications.

PERFORMANCE OBJECTIVES

SKILLS

0024.01 **Identify and respond to workplace hazards,** including ground conditions, ventilation, open holes above/ below, and housekeeping, by isolating the area and repairing and/or reporting deficiencies, according to government legislation and company standards.

Signatures of:

_____	_____	_____
Date Completed	Trainee	Supervisor/Trainer

0024.02 **Inspect and scale workplace** by selecting a scaling bar for the specific job, based on type, size, and condition; fastening and connecting hoses; washing down the area; setting water flow to control dust; performing scaling procedures; checking ventilation flow; identifying bootlegs and misholes, using non-sparking materials; and repairing and/or reporting deficiencies, according to government legislation and company standards.

Signatures of:

_____	_____	_____
Date Completed	Trainee	Supervisor/Trainer

0024.00 OPERATE UTILITY VEHICLE (cont.)

0024.03 **Perform pre-operational checks on utility vehicle** by testing power source; checking fluid levels; following refuelling and lubricating procedures; inspecting principle components, including steps and handrails, canopy/cab, chassis, engine/power source, power train, hydraulic cylinders and systems, controls, wheel chocks, lighting, and warning and communication systems; visually inspecting fire extinguishers and/or fire-suppression systems; checking pins and nozzles; inspecting tire and wheel assemblies; inspecting braking system; using three-point contact while mounting and dismounting; locking out and/or tagging; and repairing and/or reporting deficiencies, according to government legislation, company standards, and manufacturers' specifications.

Signatures of:

_____	_____	_____
Date Completed	Trainee	Supervisor/Trainer

0024.04 **Start up utility vehicle** by activating power source; using warning systems; observing equipment operation, gauges, and load limits; checking for clearances and activity in area; locking out and/or tagging; and repairing and/or reporting deficiencies, according to government legislation, company standards, and manufacturers' specifications.

Signatures of:

_____	_____	_____
Date Completed	Trainee	Supervisor/Trainer

0024.00 OPERATE UTILITY VEHICLE (cont.)

0024.05 **Conduct operational checks on utility vehicle** by monitoring gauges and meters, including oil and air pressure, lights and warning systems, temperature, alternator output, transmission, and torque pressure; listening for unusual noises in engine/power train; inspecting steering; testing brakes; locking out and/or tagging; and repairing and/or reporting deficiencies, according to government legislation, company standards, and manufacturers' specifications.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0024.06 **Operate utility vehicle** by ensuring clearances and clear vehicle path; complying with speed limits, traffic signs, and signals; ensuring secure trailer hitches; observing load limitations; securing load; selecting gears for ramps; testing brakes prior to entering ramps; ensuring vehicle is immobile during loading/unloading of materials/personnel; following procedures for transporting explosives as required; maintaining road ways; ensuring required ventilation; noting direction of the ventilation flow and position of ventilation/fire doors; locking out and/or tagging; and repairing and/or reporting deficiencies, according to government legislation, company standards, and manufacturers' specifications.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0024.00 OPERATE UTILITY VEHICLE (cont.)

0024.07 **Shut down utility vehicle** by positioning vehicle in designated/approved area, setting park brake, shutting off power, applying wheel chocks, completing operator report, locking out and/or tagging, and repairing and /or reporting deficiencies, according to government legislation, company standards, and manufacturers' specifications.

Signatures of:

_____	_____	_____
Date Completed	Trainee	Supervisor/Trainer

0011.00 EXTEND SERVICES

GENERAL PERFORMANCE OBJECTIVE

Extend services by identifying and responding to workplace hazards; inspecting and scaling workplace; operating lifting mechanism(s); installing pipe and ventilation supports; locking out and/or tagging services; installing pipelines and ventilation; reactivating air, water, and auxiliary ventilation; and tearing down, moving, and storing tools and equipment, according to government legislation, company standards, and manufacturers' specifications.

PERFORMANCE OBJECTIVES

SKILLS

0011.01 **Identify and respond to workplace hazards,** including ground conditions, ventilation, open holes above/below, and housekeeping, by isolating the area and repairing and/or reporting deficiencies, according to government legislation and company standards.

Signatures of:

_____	_____	_____
Date Completed	Trainee	Supervisor/Trainer

0011.02 **Inspect and scale workplace** by selecting a scaling bar for the specific job, based on type, size, and condition; washing down the area; following scaling procedures; selecting, repairing, and fastening connecting hoses; setting water flow to control dust; checking ventilation flow; and taking corrective action and/or reporting deficiencies, according to government legislation and company standards.

Signatures of:

_____	_____	_____
Date Completed	Trainee	Supervisor/Trainer

0011.00 EXTEND SERVICES (cont.)

0011.03 **Operate lifting mechanism(s),** including chain blocks, blocks and tackle, come-alongs, anchors, tugger hoist, and staging, by using fall protection, including fall-arrest or travel-restraint systems; lifting within equipment limitations; checking for hazards, including pinch points, frayed cables, suspended loads, and shifting equipment; locking out and/or tagging; and repairing and/or reporting deficiencies, according to government legislation, company standards, and manufacturers' specifications.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0011.04 **Install pipe, ventilation, power cable, and communication line/cable supports using materials,** including anchor bolts, chains, hangers, messenger cables, rock pins, and trestles, by operating drilling equipment, including stoper and jackleg drills, and repairing and/or reporting deficiencies, according to government legislation, company standards, and manufacturers' specifications.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0011.05 **Lock out and/or tag services,** including air, water, auxiliary ventilation, and electrical, by shutting off and bleeding air and water lines, deactivating power supply, and repairing and/or reporting deficiencies, according to government legislation, company standards, and manufacturers' specifications.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0011.00 **EXTEND SERVICES** (cont.)

0011.06 **Install pipelines, ventilation, communication lines/cable, and power cable using tools and materials,** including wrenches, bars, vent/pipe clamps, hangers, fittings, straps, steel/plastic pipe, and collapsible/ridged ventilation tubing, by inspecting pipes, fittings, headers and pipe supports, and messenger cable, and repairing and/or reporting deficiencies, according to government legislation, company standards, and manufacturers' specifications.

Signatures of:

_____	_____	_____
Date Completed	Trainee	Supervisor/Trainer

0011.07 **Reactivate air, water, and auxiliary ventilation** by removing locks and/or tags, flushing and pressurizing air and water lines, checking for leaks, restoring power, and repairing and/or reporting deficiencies, according to government legislation, company standards, and manufacturers' specifications.

Signatures of:

_____	_____	_____
Date Completed	Trainee	Supervisor/Trainer

0011.08 **Tear down, move, and store tools and equipment in designated/approved areas** and repair and/or report deficiencies, according to government legislation and company standards.

Signatures of:

_____	_____	_____
Date Completed	Trainee	Supervisor/Trainer

0240.00 OPERATE JACKLEG/STOPER/PLUGGER

GENERAL PERFORMANCE OBJECTIVES

Operate jackleg/stoper/plugger by identifying and responding to workplace hazards, inspecting workplace and scaling loose rock, extending services, preparing the face for drilling, setting up drills, performing pre-operational checks, operating drills, maintaining drills, installing rock bolts, and tearing down and storing drills.

PERFORMANCE OBJECTIVES

SKILLS

0240.01 **Identify and respond to workplace hazards,** including poor ground conditions, inadequate ventilation, open holes above/below, and poor housekeeping, by isolating the area to ensure safe working conditions to protect self and others, and by repairing and/or reporting deficiencies, according to government legislation and company standards.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0240.02 **Inspect workplace and scale loose rock** by selecting a scaling bar for the specific job, based on length, metal type, size, and condition; washing down the area/face as required; selecting, repairing, and fastening connecting hoses; setting water flow; and repairing and/or reporting deficiencies, according to government legislation and company standards.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0240.00 OPERATE JACKLEG/STOPER/PLUGGER (cont.)

0240.03 **Extend services,** including air, water, power, ventilation, and communication lines, by bleeding air and water lines; flushing and installing headers; fastening, securing, hanging, and supporting services; locking out and/or tagging; and reporting deficiencies, according to government legislation and company standards.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0240.04 **Prepare face for drilling** by blowing/flushing lines, connecting air and water hoses, washing area/face, scaling loose rock, cleaning and marking bootlegs, using non-sparking materials, applying procedures for handling misholes, cleaning and marking lifters, controlling drainage, locking out and/or tagging, and repairing and/or reporting deficiencies, according to government legislation and company standards.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0240.05 **Set up drills,** including stoper, jackleg, and plugger, with controls in the off position, by visually inspecting drill components, selecting/checking rock drill steel and bits, blowing air and water hoses to ensure unobstructed air and water flow, connecting lubricator to hoses, connecting hoses to drill, and filling lubricator using hand tools, including various types of wrenches, according to company standards and manufacturers' specifications.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0240.00 OPERATE JACKLEG/STOPER/PLUGGER (cont.)

0240.06 **Perform pre-operational checks on stoper drill components, with controls in the off position and air and water header open,** including guards, steel, retainers, foot spike, air and water controls, side rods and gooseneck, by positioning stoper and spike, using controls, advancing and retracting leg, rotating chuck, checking water flow, and repairing and/or reporting deficiencies, according to government legislation, company standards, and manufacturers' specifications.

Signatures of:

_____	_____	_____
Date Completed	Trainee	Supervisor/Trainer

0240.07 **Perform pre-operational checks on jackleg drill components, with controls in the off position and air and water header open,** including machine air leg; leg to machine assembly; air, water, and water tube controls; side rods; chucks; leg foot; steel retainer; and leg control, by positioning jackleg, using controls, rotating chuck, extending and retracting leg, checking water flow and steel retainer, and repairing and/or reporting deficiencies, according to government legislation, company standards, and manufacturers' specifications.

Signatures of:

_____	_____	_____
Date Completed	Trainee	Supervisor/Trainer

0240.08 **Perform pre-operational checks on plugger components, with controls in the off position and air and water header open,** including air, water, and water tube controls; side rods; chucks; and steel retainer, by checking handles and springs, using controls, rotating chuck, checking water flow, and repairing and/or reporting deficiencies, according to government legislation, company standards, and manufacturers' specifications

Signatures of:

_____	_____	_____
Date Completed	Trainee	Supervisor/Trainer

0240.00 OPERATE JACKLEG/STOPER/PLUGGER (cont.)

0240.09 **Operate drill** by collaring/drilling hole to predetermined depth; checking lubrication, hoses, controls, and general condition and operation of the drill; ensuring proper footing; identifying/avoiding pinch points; wearing personal protective equipment; and repairing and/or reporting deficiencies, according to government legislation, company standards, and manufacturers' specifications.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0240.10 **Maintain drill and attachments** by checking lubrication, hoses, controls, goosenecks, and general condition of drill, steel, and bits for worn/defective components, to ensure safe and efficient operation, and by repairing and/or reporting deficiencies, according to government legislation, company standards, and manufacturers' specifications.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0240.00 OPERATE JACKLEG/STOPER/PLUGGER (cont.)

0240.11 **Install rock bolts,** including rebar and mechanical bolts, ensuring required torque by using drill and dolly according to government legislation, company standards, and manufacturers' specifications.

Signatures of:

_____	_____	_____
Date Completed	Trainee	Supervisor/Trainer

0240.12 **Tear down and store drill** by shutting off and bleeding air and water lines, disconnecting air and water hoses, performing post-operational checks by visually inspecting drill components, completing reports, storing drilling equipment in designated/approved area, locking out and/or tagging, and repairing and/or reporting deficiencies, according to government legislation, company standards, and manufacturers' specifications.

Signatures of:

_____	_____	_____
Date Completed	Trainee	Supervisor/Trainer

0003.00 SET UP WOODEN STAGING

GENERAL PERFORMANCE OBJECTIVE

Set up wooden staging by identifying and responding to workplace hazards; inspecting and preparing workplace for scaling; planning and organizing work site; constructing and erecting staging and ladders; and tearing down, moving, and storing wooden staging.

PERFORMANCE OBJECTIVES

SKILLS

0003.01 **Identify and respond to workplace hazards,** including ground conditions, ventilation, open holes above/below, and housekeeping, by isolating the area, locking out and/or tagging, and repairing and/or reporting deficiencies, according to government legislation and company standards.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0003.02 **Inspect and prepare workplace for scaling** by selecting a scaling bar for the specific job, based on length, metal type, size, and condition; washing down the face; selecting, repairing, and fastening connecting hoses; setting water flow; and repairing and /or reporting deficiencies, according to government legislation and company standards.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0003.00 SET UP WOODEN STAGING (cont.)

0003.03 **Plan and organize worksite** by visually inspecting site; measuring area for required timber and materials, including eye bolts and ladders; selecting and delivering materials and timber to staging area; storing in preparation for staging; and assembling power and hand tools, including axes, hammer, nails, saws, chains, stoper, and jackleg, according to government legislation and company standards.

Signatures of:

_____	_____	_____
Date Completed	Trainee	Supervisor/Trainer

0003.04 **Construct and erect wooden staging and ladders** by transporting selected timber to staging area; safeguarding open holes, manways, low clearances, and mobile equipment; setting up warning signs, fall-arrest systems, and guard rails; supporting staging using chains, muck pile, and/or spraggs; and placing and attaching ladders to ensure free access, according to government legislation and company standards.

Signatures of:

_____	_____	_____
Date Completed	Trainee	Supervisor/Trainer

0003.05 **Tear down, move, and store wooden staging** by removing and storing dismantled staging and equipment in pre-assigned area; using designated mobile equipment, including scoops, utility vehicles, trucks, or manual means; repairing and/or reporting hazards, including protruding nails, loose rock, and unstored tools, hoses, and pipes, open holes, and mobile equipment; and storing planks, nails, chains, eye bolts, ladders, and laggings, according to government legislation and company standards.

Signatures of:

_____	_____	_____
Date Completed	Trainee	Supervisor/Trainer

0003A.00 SET UP PRE-CONSTRUCTED STAGING

GENERAL PERFORMANCE OBJECTIVE

Set up pre-constructed staging by identifying and responding to workplace hazards, inspecting and preparing workplace for scaling, locking out and/or tagging mobile and fixed equipment, performing equipment pre-operational checks, placing and setting up staging, erecting standard ladders, and tearing down and storing staging.

PERFORMANCE OBJECTIVES

SKILLS

0003A.01 **Identify and respond to workplace hazards,** including ground conditions, ventilation, open holes above/below, and housekeeping, by isolating the area and repairing and/or reporting deficiencies, according to government legislation and company standards.

Signatures of:

_____	_____	_____
Date Completed	Trainee	Supervisor/Trainer

0003A.02 **Inspect and prepare workplace for scaling** by selecting a scaling bar for the specific job, based on length, metal type, size, and condition; washing down the face; selecting, repairing, and fastening connecting hoses; setting water flow; and repairing and/or reporting deficiencies, according to government legislation and company standards.

Signatures of:

_____	_____	_____
Date Completed	Trainee	Supervisor/Trainer

0003A.00 SET UP PRE-CONSTRUCTED STAGING (cont.)

0003A.03 Lock out and/or tag fixed equipment, including conveyors, chutes, loading pockets, and crushers, for repair and maintenance by shutting down machine and process, if required; ensuring no materials can enter equipment being repaired or maintained; tagging and/or reporting deficiencies; and barricading and/or erecting signs, according to government legislation, company standards and manufacturer specifications.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0003A.04 Perform equipment pre-operational check on staging by visually inspecting equipment; using three-point contact while mounting and dismounting; locating components, including ladders, lagging, legs, chains, guard rails, anchors, and wings; and repairing and/or reporting deficiencies, according to government legislation, company standards, and manufacturers' specifications.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0003A.05 Place and set up pre-constructed staging by installing wings and guard rails as required; and locating, securing, aligning, and spacing staging, according to government legislation, company standards, and manufacturers' specifications.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0003A.00 SET UP PRE-CONSTRUCTED STAGING (cont.)

0003A.06 Erect standard ladders, including wooden and steel, securing for access by using chains and/or nails, and checking for deterioration, according to government legislation, company standards, and manufacturers' specifications.

Signatures of:

_____	_____	_____
Date Completed	Trainee	Supervisor/Trainer

0003A.07 Tear down and store pre-constructed staging by removing and storing hoses, pipes, materials, and equipment; storing staging in designated area; folding wings and removing guards; correcting and/or reporting hazards, including protruding nails, poor housekeeping, and loose rock; and storing tools, according to government legislation, company standards, and manufacturers' specifications.

Signatures of:

_____	_____	_____
Date Completed	Trainee	Supervisor/Trainer

0003B.00 SET UP MECHANICAL STAGING

GENERAL PERFORMANCE OBJECTIVE

Set up mechanical staging by identifying and responding to workplace hazards, inspecting and preparing workplace for scaling, performing pre-operational checks, operating mechanical staging, and performing shutdown on staging.

PERFORMANCE OBJECTIVES

SKILLS

0003B.01 **Identify and respond to workplace hazards,** including ground conditions, ventilation, open holes above/below, and housekeeping, by isolating the area, locking out and/or tagging, and repairing and/or reporting deficiencies, according to government legislation and company standards.

Signatures of:

_____	_____	_____
Date Completed	Trainee	Supervisor/Trainer

0003B.02 **Inspect and prepare workplace for scaling** by selecting a scaling bar for the specific job, based on length, metal type, size, and condition; washing down the face; selecting, repairing, and fastening connecting hoses; setting water flow; and repairing and/or reporting deficiencies, according to government legislation and company standards.

Signatures of:

_____	_____	_____
Date Completed	Trainee	Supervisor/Trainer

0003B.00 SET UP MECHANICAL STAGING (cont.)

0003B.03 Perform equipment pre-operational check on mechanical staging by installing ladders and guard rails, using three-point contact while mounting and dismounting, visually checking fluid levels and fire extinguisher and/or fire-suppression systems, and maintaining housekeeping standards, according to government legislation, company standards, and manufacturer specifications.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0003B.04 Operate mechanical staging by raising and lowering the platform and/or jacks, checking ventilation, and maintaining housekeeping standards, according to government legislation, company standards, and manufacturers' specifications.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0003B.05 Perform shutdown on mechanical staging by cleaning and lowering platform; raising jacks; repairing and/or reporting potential hazards, including protruding nails, poor housekeeping, and loose rock; storing tools; removing and storing hoses, pipes, materials, and equipment; and locking out and/or tagging equipment, according to government legislation, company standards, and manufacturers' specifications.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0245.00 MOVE DRILL AND EQUIPMENT

GENERAL PERFORMANCE OBJECTIVE

Move drill and equipment by reading and interpreting layout, planning drill moving destination, determining moving method, securing loads, and storing equipment.

PERFORMANCE OBJECTIVES

SKILLS

0245.01 **Read layout,** prior to commencement of work, to be familiar with hole location(s), job site environment, and safety hazards, according to government legislation and company standards.

Signatures of:

_____	_____	_____
Date Completed	Trainee	Supervisor/Trainer

0245.02 **Plan move prior to mobilizing** by identifying route using mine plans/communications, and identifying and responding to workplace hazards, including ground conditions and ventilation, according to government legislation and company standards.

Signatures of:

_____	_____	_____
Date Completed	Trainee	Supervisor/Trainer

0245.00 MOVE DRILL AND EQUIPMENT (cont.)

0245.03 **Determine moving method** by selecting equipment type, including scoop, utility vehicle, motor, forklift, and cage, to ensure drill and equipment are moved in a safe and efficient manner, using appropriate communications, according to government legislation, company standards, and manufacturers' specifications.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0245.04 **Secure loads, using appropriate methods and equipment,** including chains, bear traps, slings, and clevis, to ensure drill and equipment are transported in a safe and efficient manner, according to government legislation, company standards, and manufacturers' specifications.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0245.05 **Store drill and equipment in a designated area** by following good housekeeping practices, according to company standards.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0246.00 SET UP DRILL

GENERAL PERFORMANCE OBJECTIVES

Set up drill by identifying and responding to workplace hazards, inspecting and preparing the workplace for scaling, reading the layout, organizing the workplace, extending services, setting up lighting, operating lifting mechanisms, lining up and levelling drill, installing anchors, setting up staging, installing rod racks, installing safety devices, setting up water pumps, connecting air/water services, connecting hydraulic hoses, and setting up safety barriers.

PERFORMANCE OBJECTIVES

SKILLS

0246.01 **Identify and respond to workplace hazards,** including ground conditions, ventilation, open holes above/below, and housekeeping, by isolating area and repairing and/or reporting deficiencies, according to government legislation and company standards.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0246.02 **Inspect and prepare workplace for scaling** by selecting a scaling bar for the specific job, based on type, size, and condition; fastening and connecting hoses; washing down the area; setting water flow to control dust; performing scaling procedures; visually inspecting and sounding walls and back to determine ground conditions; identifying loose rock; taking action to remove or guard loose rock; checking ventilation flow; and taking corrective action and/or reporting deficiencies, according to government legislation and company standards.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0246.00 SET UP DRILL (cont.)

0246.03 **Read layout,** prior to commencement of work, to be familiar with hole location(s), job site environment, and safety hazards, according to government legislation and company standards.

Signatures of:

_____	_____	_____
Date Completed	Trainee	Supervisor/Trainer

0246.04 **Plan and organize workplace** by scheduling delivery of equipment, including core boxes, hoses, and rod racks; and planning location/position of drill and other related equipment to ensure safe and efficient operation, according to government legislation and company standards.

Signatures of:

_____	_____	_____
Date Completed	Trainee	Supervisor/Trainer

0246.05 **Extend services,** including air, water, power, ventilation, and communication lines, by bleeding air and water lines; flushing and installing headers; fastening, securing, hanging, and supporting services; locking out and/or tagging; and repairing and/or reporting deficiencies, according to government legislation, company standards, and manufacturers' specifications.

Signatures of:

_____	_____	_____
Date Completed	Trainee	Supervisor/Trainer

0246.00 SET UP DRILL (cont.)

0246.06 **Set up lighting** using appropriate hangers in a safe location, checking fixtures/power cords for damage, and repairing and/or reporting deficiencies, according to government legislation and company standards.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0246.07 **Operate lifting mechanisms,** including tugger hoists, winches, electric or manual chain blocks, block and tackle, come-alongs, and jacks, by activating power sources; maintaining communication; observing equipment operation, gauges, and load limits; testing brakes; checking for clearances and activity in the area; locking out and/or tagging; responding to hazards, including suspended loads and pinch points; and repairing and/or reporting deficiencies, according to government legislation, company standards, and manufacturers' specifications.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0246.08 **Line up and level drill** by positioning drill on proper azimuth and inclination, according to layout, government legislation, and company standards.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0246.00 **SET UP DRILL** (cont.)

0246.09 **Install anchor(s) for drill** by using jackleg, stoper, plugger, or diamond drill; and securing the drill by use of rebar, mechanical bolts, and wedge bolts, according to government legislation, company standards, and manufacturers' specifications.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0246.10 **Set up staging,** including wooden staging, pre-constructed staging, and mechanical staging, according to layout; and repairing and/or reporting deficiencies, according to government legislation, company standards, and manufacturers' specifications.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0246.11 **Install rod racks** by determining proper location; using anchors, bolts, and safety chains; and identifying/avoiding pinch points, according to government legislation, company standards, and manufacturers' specifications.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0246.00 SET UP DRILL (cont.)

0246.12 **Install safety devices,** including fire extinguishers, fall protection, hazardous gas tester, barricade/signs, and guards, ensuring the safety of self and others, and repairing and/or reporting deficiencies, according to government legislation, company standards, and manufacturers' specifications.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0246.13 **Set up water pump(s)** by determining location; connecting appropriate hoses to water distribution system, including storage tank, water controls, coolers, valves, and fittings, and repairing and/or reporting deficiencies, according to government legislation, company standards, and manufacturers' specifications.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0246.14 **Connect air/water services to drill equipment** by flushing lines; installing hoses, whip checks, hangers, couplers, safety chains, and valves; ensuring hoses are hung and coiled; eliminating hazards; and repairing and/or reporting deficiencies, according to government legislation, company standards, and manufacturers' specifications

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0246.00 **SET UP DRILL** (cont.)

0246.15 **Connect hydraulic hoses to drill equipment** by using hand tools, ensuring cleanliness of hoses and fittings, ensuring hoses are correctly located and connected, ensuring safety of self and others, and repairing and/or reporting deficiencies, according to government legislation, company standards, and manufacturers' specifications.

Signatures of:

_____	_____	_____
Date Completed	Trainee	Supervisor/Trainer

0246.16 **Set up safety barriers** by placing guards, including fencing, signage, chains, warning devices, de-railers, and stop blocks; ensuring proper communications; and repairing and/or reporting deficiencies, according to government legislation, company standards, and manufacturers' specifications.

Signatures of:

_____	_____	_____
Date Completed	Trainee	Supervisor/Trainer

0247.00 MAINTAIN DRILLING EQUIPMENT

GENERAL PERFORMANCE OBJECTIVES

Maintain drilling equipment by performing pre-operational checks on drill, conducting operational checks on drill, performing emergency shutdown, maintaining fluid levels, monitoring system components, maintaining wire line equipment, maintaining in the hole tools, maintaining water pumps, and locking out and/or tagging.

PERFORMANCE OBJECTIVES

SKILLS

0247.01 **Perform pre-operational checks on drill, with controls in neutral position,** by confirming power source; checking fluid levels; lubricating grease fittings; inspecting gauges and principal components, including pumps, steps, hand rails, machine guards, rod rack, core boxes, controls, trailing cable, lighting, warning systems, and fire extinguishers and/or fire-suppression systems; and locking out and/or tagging to ensure the safety of self and others and safe operation of drill; and repairing and/or reporting deficiencies, according to government legislation, company standards, and manufacturers' specifications.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0247.00 MAINTAIN DRILLING EQUIPMENT (cont.)

0247.02 **Conduct operational checks on drill** by activating the power source(s); monitoring gauges and meters, including oil, air, voltage, amperage, and water pressure; lights and warning systems; temperature; and system pressure; listening for unusual noises in power train; locking out and/or tagging; and repairing and/or reporting deficiencies, according to government legislation, company standards, and manufacturers' specifications.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0247.03 **Perform emergency shutdown** by de-activating all power sources, ensuring the safety of self and others, according to government legislation, company standards, and manufacturers' specifications.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0247.04 **Maintain fluid levels and lubricate grease points on drill components** by monitoring all levels, according to manufacturers' specifications and company standards.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0247.00 MAINTAIN DRILLING EQUIPMENT (cont.)

0247.05 **Monitor system components,** including gauges, meters, and computer monitor(s), by visually checking to ensure safe and efficient operation of the drill equipment, according to government legislation, company standards, and manufacturers' specifications.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0247.06 **Maintain wire line hoist and components** by lubricating and checking condition of guards, level wind, wire line cable, clamps, and pulleys, according to government legislation, company standards, and manufacturers' specifications.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0247.07 **Maintain in the hole tools,** including bit, shell, inner/outer tube assembly, water swivel, and rods, by checking components for appropriate tolerances and signs of deficiencies, and repairing and/or replacing defective parts to ensure the safety of self and others, according to company standards and manufacturers' specifications.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0247.00 MAINTAIN DRILLING EQUIPMENT (cont.)

0247.08 **Maintain water pump** by checking condition of guard, relief valve, fittings, hoses, and gauges; lubricating them; repairing and/or reporting deficiencies; and ensuring the safety of self and others, according to government legislation, company standards, and manufacturers' specifications.

Signatures of:

_____	_____	_____
Date Completed	Trainee	Supervisor/Trainer

0247.09 **Lock out and/or tag drill equipment for repair and maintenance** by shutting down the equipment; de-activating power sources; and reporting deficiencies, according to government legislations, company standards, and manufacturers' specifications.

Signatures of:

_____	_____	_____
Date Completed	Trainee	Supervisor/Trainer

0237.00 HANDLE CORE

GENERAL PERFORMANCE OBJECTIVE

Handle core by emptying core tube, placing core in core box, securing and identifying core box(es), and preparing and maintaining core tube assembly.

PERFORMANCE OBJECTIVES

SKILLS

0237.01 **Empty core tube** according to company standards and manufacturers' specifications, ensuring safety of self and others.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0237.02 **Place core in core box** according to company standards, ensuring the safety of self and others.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0237.00 HANDLE CORE (cont.)

0237.03 Secure and identify core box(es) for transportation, including marking the core box with the required information inside and out, and sealing the box securely, according to company standards.

Signatures of:

_____	_____	_____
Date Completed	Trainee	Supervisor/Trainer

0237.04 Prepare and maintain core tube assembly by checking for obstructions and worn parts; cleaning, lubricating, and removing any obstructions; and replacing worn parts, according to manufacturers' specifications.

Signatures of:

_____	_____	_____
Date Completed	Trainee	Supervisor/Trainer

0248.00 TEAR DOWN DIAMOND DRILL AND EQUIPMENT

GENERAL PERFORMANCE OBJECTIVE

Tear down diamond drill and equipment by disconnecting drill anchors, locking and tagging power sources, unhooking services, packaging drill and equipment, dismantling staging, removing barriers, and ensuring workplace housekeeping is maintained.

PERFORMANCE OBJECTIVES

SKILLS

0248.01 **Disconnect drill from anchor(s) and/or remove anchor(s)** by using the appropriate hand tools, ensuring the safety of self and others, according to company standards and manufacturers' specifications.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0248.02 **Operate lifting mechanisms,** including tugger hoists, winches, electric or manual chain blocks, block and tackle, come-alongs and jacks, by activating power sources; maintaining communication; observing equipment operation, gauges, and load limits; testing brakes; checking for clearances and activity in the area; locking out and/or tagging; responding to hazards, including suspended loads and pinch points; and repairing and/or reporting deficiencies, according to government legislation, company standards, and manufacturers' specifications.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0248.00 TEAR DOWN DIAMOND DRILL AND EQUIPMENT (cont.)

0248.03 **Disconnect services,** including air, water, hydraulic, and electrical, by identifying services to be locked out and/or tagged, shutting off and bleeding air and water lines, disconnecting power supply to drill equipment, repairing and/or reporting deficiencies, according to government legislation, company standards, and manufacturers' specifications.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0248.04 **Package drill and equipment** by coiling hoses; separating components according to size, weight, and method for moving; and ensuring the safety of self and others, according to government legislation, company standards, and manufacturers' specifications.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0248.00 TEAR DOWN DIAMOND DRILL AND EQUIPMENT (cont.)

0248.05 **Tear down, move, and store dismantled staging and equipment in pre-assigned area using designated mobile equipment,** including scoops, utility vehicles, motors, trucks, or manual means; repairing and/or reporting hazards, including protruding nails, loose rock, and unstored tools, hoses, and pipes, and open holes; and storing planks, nails, chains, eye bolts, ladders, and laggings, according to government legislation, company standards, and manufacturers' specifications.

Signatures of:

_____	_____	_____
Date Completed	Trainee	Supervisor/Trainer

0248.06 **Tear down safety barriers** by removing guards, including fencing, signage, chains, warning devices, de-railers, and stop blocks, to allow personnel/equipment access to drill site; ensuring proper communications; and repairing and/or reporting deficiencies, according to government legislation, company standards, and manufacturers' specifications.

Signatures of:

_____	_____	_____
Date Completed	Trainee	Supervisor/Trainer

0013.00 OPERATE LIFTING MECHANISM(S)

GENERAL PERFORMANCE OBJECTIVE

Operate lifting mechanism(s) underground to raise and lower materials/equipment by identifying and responding to workplace hazards, inspecting and scaling workplace, performing pre-operational checks on lifting mechanism(s), starting up lifting mechanism(s), selecting and using slinging equipment, raising and lowering materials/equipment, and shutting down lifting mechanism(s), according to government legislation, company standards, and manufacturers' specifications. Equipment operation includes tugger hoists, winches, air/electric chain hoists, chain blocks, block and tackles, and come-alongs.

PERFORMANCE OBJECTIVES

SKILLS

0013.01 **Identify and respond to workplace hazards,** including ground conditions, ventilation, open holes above/below, and housekeeping, by isolating the area and reporting deficiencies, according to government legislation and company standards.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0013.02 **Inspect and scale workplace** by selecting a scaling bar for the specific job, based on type, size, and condition; washing down the area; fastening and connecting hoses; setting water flow to control dust; performing scaling procedures; checking ventilation flow; and taking corrective action and/or reporting deficiencies, according to government legislation and company standards.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0013.00 OPERATE LIFTING MECHANISM(S) (cont.)

0013.03 **Perform pre-operational checks on lifting mechanism(s),** including tugger hoists, winches, air/electric chain hoists, chain blocks, and come-alongs, by testing power source; checking fluid levels; following lubricating procedures; inspecting principle components, including cable(s), cable guides, sprockets, chains, block, drum, hook and safety latches, slings and hardware, main disconnect, limit switches, directional controls, stop-start switches, remote control, lighting, and warning and communication systems; using fall protection, including fall-arrest or travel-restraint systems; visually inspecting fire extinguishers; inspecting/testing braking system; locking out and/or tagging; and repairing and/or reporting deficiencies, according to government legislation, company standards, and manufacturers' specifications.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0013.04 **Operate lifting mechanisms,** including tugger hoists, winches, electric or manual chain blocks, block and tackle, come-alongs and jacks, by activating power sources; maintaining communication; observing equipment operation, gauges, and load limits; testing brakes; checking for clearances and activity in the area; locking out and/or tagging; responding to hazards, including suspended loads and pinch points; and repairing and/or reporting deficiencies, according to government legislation, company standards, and manufacturers' specifications.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0013.00 OPERATE LIFTING MECHANISM(S) (cont.)

0013.05 **Select and use slinging equipment** by determining site conditions and type of materials required, including wire rope, nylon slings, and chains; using personal protective equipment; inspecting anchor points; and determining sling size, cable, hook diameter, and tag lines, according to government legislation, company standards, and manufacturers' specifications.

Signatures of:

_____	_____	_____
Date Completed	Trainee	Supervisor/Trainer

0013.06 **Raise and lower materials/equipment using lifting mechanism(s),** including tugger hoists, winches, air/electric chain hoists, chain blocks, block and tackles, and come-alongs, by determining load, size of material, and pinch points; raising and lowering materials; ensuring clear path for load travel; loading/unloading materials using predetermined signals; operating audio and/or visual communication systems; observing load limits; controlling load; responding to hazards of suspended loads; ensuring clearances; following shutdown procedures as required; locking out and/or tagging; and repairing and/or reporting deficiencies, according to government legislation, company standards, and manufacturers' specifications.

Signatures of:

_____	_____	_____
Date Completed	Trainee	Supervisor/Trainer

0013.00 OPERATE LIFTING MECHANISM(S) (cont.)

0013.07 **Shut down lifting mechanism(s)** by removing/securing load, removing slinging components, setting brake, shutting off power supply, storing slinging equipment in designated/approved area, protecting equipment, performing post-operational checks, locking out and/or tagging, and repairing and/or reporting deficiencies, according to government legislation, company standards, and manufacturers' specifications.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0243.00 OPERATE DIAMOND DRILL

GENERAL PERFORMANCE OBJECTIVES

Operate diamond drill by identifying and responding to workplace hazards, inspecting workplace, checking for adequate oxygen levels and hazardous gases, reading logbooks, reading layouts, checking drill alignment, performing pre-operational checks, starting up drill, conducting operational checks, drilling hole to predetermined depth, pulling inner tube from drill hole, identifying in-hole conditions, testing hole, hoisting and lowering rods, plugging drill holes, marking holes, and shutting down drill.

PERFORMANCE OBJECTIVES

SKILLS

0243.01 **Identify and respond to workplace hazards,** including poor ground conditions, inadequate ventilation, open holes above/below, and poor housekeeping, by isolating area to ensure safe working conditions and to protect self and others, and by repairing and/or reporting deficiencies, according to government legislation and company standards.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0243.02 **Inspect workplace and scale loose rock** by selecting a scaling bar for the specific job, based on length, metal type, size, and condition; washing down the area/face as required; selecting, repairing, and fastening connecting hoses; setting water flow; and repairing and/or reporting deficiencies, according to government legislation and company standards.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0243.00 OPERATE DIAMOND DRILL (cont.)

0243.03 Check for adequate oxygen levels and the presence of hazardous gases, including methane, carbon monoxide, and hydrogen sulphide, by monitoring the workplace using meters, smell, sound, and sight to protect self and others, according to government legislation and company standards.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0243.04 Read logbook before operating drill, taking corrective actions for any discrepancies at the drill site or abnormalities in the drill hole, including damaged bits; broken rods, shell, and core barrel; and hole deviation, ensuring that all information regarding drill and drill hole are documented for the oncoming operator, according to government legislation and company standards.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0243.05 Read layout, prior to commencement of work, to be familiar with hole location(s) and job site environment and safety hazards, performing work as directed by layout, according to government legislation and company standards.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0243.00 OPERATE DIAMOND DRILL (cont.)

0243.06 **Check drill alignment** by comparing the layout to the actual drill setup to ensure that the drill is on correct inclination and azimuth, according to company standards.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0243.07 **Perform pre-operational checks on drill, with controls in neutral position,** by confirming power source; checking fluid levels; lubricating grease fittings; inspecting gauges and principal components, including pumps, steps, hand rails, machine guards, rods, rod rack, core boxes, controls, trailing cable, lighting, warning systems, and fire extinguishers and/or fire-suppression systems; locking out and/or tagging to ensure the safety of self and others and safe operation of drill; and repairing and/or reporting deficiencies, according to government legislation, company standards, and manufacturers' specifications.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0243.00 OPERATE DIAMOND DRILL (cont.)

0243.08 **Start up drill** by activating the power source(s); monitoring gauges and meters, including oil, air, voltage, amperage, and water pressure; lights and warning systems; temperature; and system pressure; listening for unusual noises in power train; locking out and/or tagging; and repairing and/or reporting deficiencies, according to government legislation, company standards, and manufacturers' specifications.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0243.09 **Conduct operational checks on drill** by monitoring gauges and meters, including oil, air, and water pressure; lights and warning systems; temperature; system pressure; listening for unusual noises in power train; locking out and/or tagging; and repairing and/or reporting deficiencies, according to government legislation, company standards, and manufacturers' specifications.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0243.10 **Drill hole to a predetermined depth** by collaring/installing casing, following layout and breakthrough procedures, introducing additives when required, monitoring excessive water pressure and/or flow, checking exhaust systems, locking out and/or tagging, and repairing and/or reporting deficiencies, according to government legislation, company standards, and manufacturers' specifications.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0243.00 OPERATE DIAMOND DRILL (cont.)

0243.11 **Pull inner tube from drill hole** by conventional or wire line methods to recover drill core, according to company standards and/or manufacturers' specifications.

Signatures of:

_____	_____	_____
Date Completed	Trainee	Supervisor/Trainer

0243.12 **Identify in-hole condition,** including ground conditions, faults, stress fractures, voids, and dykes, by checking drill core, logbook entries, and layouts; and communicating with appropriate personnel, according to company standards.

Signatures of:

_____	_____	_____
Date Completed	Trainee	Supervisor/Trainer

0243.13 **Test hole according to layout, using required instruments to provide information,** including azimuth, inclination, and geological data, according to company standards and manufacturers' specifications.

Signatures of:

_____	_____	_____
Date Completed	Trainee	Supervisor/Trainer

0243.00 OPERATE DIAMOND DRILL (cont.)

0243.14 Hoist and lower rods, as required, by using the drill; ensuring that pullers, hoisting cable and plug, sheave wheel, chuck, and foot clamp jaws are in good working condition; and ensuring the safety of self and others, according to company standards and manufacturers' specifications.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0243.15 Plug drill hole, when required, by using cement, mechanical plugs, and collar plates, ensuring the safety of self and others, according to company standards and manufacturers' specifications.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0243.00 OPERATE DIAMOND DRILL (cont.)

0243.16 **Mark holes** with a single capital H, when drilling has been discontinued or an intersection or breakthrough with the drill hole is made, according to government legislation and company standards.

Signatures of:

_____	_____	_____
Date Completed	Trainee	Supervisor/Trainer

0243.17 **Shut down drill** by shutting off air and water valves and de-activating power sources, performing post-operational checks, completing operator report and/or drill report and logbook, locking out and/or tagging, and repairing and/or reporting deficiencies, according to government legislation, company standards, and manufacturers' specifications.

Signatures of:

_____	_____	_____
Date Completed	Trainee	Supervisor/Trainer

THE FOLLOWING IS A SPECIALTY MODULE

0249.00 GROUT DIAMOND DRILL HOLES

GENERAL PERFORMANCE OBJECTIVES

Grout diamond drill holes by identifying and responding to workplace hazards, inspecting workplace, reading layouts, selecting grouting equipment, performing pre-operational checks, conducting operational checks, performing grouting, maintaining grouting equipment, and storing equipment.

PERFORMANCE OBJECTIVE

SKILLS

0249.01 **Identify and respond to workplace hazards**, including poor ground conditions, inadequate ventilation, open holes above/below, and poor housekeeping, by isolating area to ensure safe working conditions and to protect self and others; and by repairing and/or reporting deficiencies, according to government legislation and company standards

Signatures of:

_____	_____	_____
Date Completed	Trainee	Supervisor/Trainer

0249.02 **Inspect workplace and scale loose rock** by selecting a scaling bar for the specific job, based on length, metal type, size, and condition; washing down the area/face as required; selecting, repairing, and fastening connecting hoses; setting water flow; and repairing and/or reporting deficiencies, according to government legislation and company standards.

Signatures of:

_____	_____	_____
Date Completed	Trainee	Supervisor/Trainer

0249.00 **GROUT DIAMOND DRILL HOLES** (cont.)

0249.03 **Read layout,** prior to commencement of work, to be familiar with hole location(s), hole specifications, job site, and environment and safety hazards, according to government legislation and company standards.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0249.04 **Select grouting equipment**, including pump, high-pressure hoses, plugs, mixing equipment, grout type, additives, and personal protective equipment, by reading layout and/or following procedures, according to government legislation, company standards, and manufacturers' specifications.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0249.05 **Perform pre-operational checks on grouting equipment, with controls in neutral position,** by confirming power source; inspecting pumps; checking fluid levels; lubricating grease fittings; inspecting gauges, principal components, guards, and controls; locking out and/or tagging to ensure the safety of self and others; and repairing and/or reporting deficiencies, according to government legislation, company standards, and manufacturers' specifications.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0249.00 GROUT DIAMOND DRILL HOLES (cont.)

0249.06 **Start up grouting equipment** by activating power source, observing equipment and gauges, checking for clearances and activity in area, locking out and/or tagging to ensure safety of self and others, and repairing and/or reporting deficiencies, according to government legislation, company standards, and manufacturers' specifications.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0249.07 **Conduct operational checks on grouting equipment** by monitoring gauges and meters, including oil, air, and pump pressure; listening for unusual noises in power train; locking out and/or tagging; and repairing and/or reporting deficiencies; according to government legislation, company standards, and manufacturers' specifications.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0249.08 **Perform grouting** by preparing grout mixture, including cement, chemicals, water, and/or additives; mixing to prescribed consistency; installing grout plugs when required; pumping grout mixture into the hole as specified; ensuring the safety of self and others; locking out and/or tagging; and repairing and/or reporting deficiencies, according to government legislation, company standards, and manufacturers' specifications.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0249.00 GROUT DIAMOND DRILL HOLES (cont.)

0249.09 **Maintain grouting equipment** by flushing grouting system; checking controls; checking lubrication and general condition of pump, mixing tank, hoses, and gauges for worn/defective components to ensure safety of self and others; locking out and/or tagging; and repairing and/or reporting deficiencies, according to government legislation, company standards, and manufacturers' specifications.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

0249.10 **Tear down and store grouting equipment** by de-activating power sources, including air, hydraulic, and electrical; bleeding air and water lines; disconnecting air, water, hydraulic, and grout hoses; performing post-operational checks; completing reports; storing equipment in designated/approved area; locking out and/or tagging; and repairing and/or reporting deficiencies, according to government legislation, company standards, and manufacturers' specifications.

Signatures of:

Date Completed	Trainee	Supervisor/Trainer

GLOSSARY OF MINING TERMS

AIR BAG:	An inflatable rubber, balloon-like device that can be used to lift heavy objects.
AIR BLAST:	A wave or rush of air that results from an underground explosion or a collapse of rock.
AIRLIFT:	A pump that moves water when air is forced into the pump's chamber. (Compressed air is introduced into the discharge pipe, and as the water and air rise, the air expands until it is almost at atmospheric pressure.)
ANCHOR RAIL:	1. A rail to which ore cars are attached prior to dumping in order to prevent them from tipping. 2. A rail buried in fill to anchor a slusher. 3. A rail holding down stationary equipment. 4. An alimak rail.
ANFO:	A blasting agent made up of ammonium nitrate and fuel oil.
ARCH or ARCHING:	The rock structure left at the intersection of the walls and back to help support the back. (Curved back formations might result naturally due to the caving of the rock or might be designed as a circular or elliptical support.)
AUXILIARY VENTILATION:	Mechanical ventilation system used to deliver air into a workplace off the main air stream (e.g., into a dead-end heading). Ventilation that is generated by auxiliary fans.
BACK:	The roof, ceiling, or upper part of any underground excavation or cavity.
BACK BLOCKING:	A method of holding mine timber sets in place or blocking to support the back.
BACKFILL:	Waste rock, cement, gravel, sand, or tailings used to refill and provide support to an excavation or stope following the removal of ore.

BALANCED HOISTING:	A conventional system of hoisting cages or skips from one horizon to another. When one cage or skip goes up, another cage or skip goes down.
BALLAST:	Broken rock, sand, or other heavy material that provides a solid, stable base for railway ties.
BARRICADE :	A closure/restriction to any mine opening.
BARRING:	Rearranging or moving out broken muck using a suitable bar.
BASE METALS:	Common non-precious metals, such as zinc, iron, copper, nickel or lead.
BASE OF RAIL:	The bottom elevation of a drift.
BEARERS or BEARING SETS:	Heavy lengths of square-set timber or steel placed in mine opening to stabilize or support the surrounding rock.
BEAT:	A portion or area of mine under the supervision of a specific individual (e.g., an area being managed or supervised by a shift boss).
BED:	A cushion of broken muck or rock ballast.
BEDDING:	Flat lying seams occurring among stratified rock and parallel to the stratification.
BELL/CORD:	The line attached to a signalling device, used to send signals for the operation of the shaft conveyance or tugger hoist.
BENCH:	A horizontal ledge or step (sometimes called a seam) that forms a single level of operation. Also a section of rock that has open faces on top and on one or more sides.
BERM:	A ridge or ledge that might be used as along a haulage way to prevent inadvertent entry.
BIN:	A box or container used for storing tools, ore, rock, or other items.

BIT:	The cutting edge, usually chisel shaped, of drill steel. The bit may be part of the drill steel or a detachable portion of the drill steel. The bit breaks or crushes the rock as the drill steel rotates. Bits are usually made of ultra-hard materials, such as tungsten-carbide or diamonds.
BLAST or BLASTING:	To use explosives or blasting agents to break rock or other material.
BLASTING AGENT:	An explosive material designed to be used in the blasting process.
BLAST HOLE:	A drilled hole into which the explosive charge or blasting agent is placed. Also referred to as a *drill hole*.
BLOCK:	A mass section or area of ore exposed by underground workings. Also refers to a pulley.
BLOCKING OUT:	The process of exposing an ore body by systematic core drilling or by developing openings on a minimum of three sides.
BLOCK HOLING:	Drilling large boulders and blasting them with small charges.
BLOW OUT:	Failure of a shot or blast to break the rock. Also referred to as a blowout shot.
BLOWING OUT:	Cleaning out a drilled hole using a blowpipe usually in preparation for blasting.
BOGIE:	1. The forward half of centre articulated mobile equipment. 2. A rail-truck used to move material.
BOOTLEG:	Bottom portion of a remnant of a blasted hole.
BOOM:	Physical extension to a piece of equipment.
BOOMING OUT:	Positioning machinery booms (e.g., jumbo booms/timbering out).
BRATTICE:	1. Wall of cloth, plank, steel, or concrete block lining commonly used for ventilation. 2. Material used to divide vertical sections in compartments of a shaft.

BREAK:	The effect or result of an underground blast. A *good break* describes well-broken ground
BREAST:	A face or heading that is being undercut.
BREAKTHROUGH:	A drift being developed that breaks into an existing opening.
BUDDY:	A work partner. In metal mines, partner is more commonly used than is buddy.
BUGGY:	A small wagon, car or truck used to transport heavy materials over short distances.
BULKHEAD:	A structure for the impoundment of water, compressed air, hydraulic backfill, or any material in an underground opening where the potential pressure against the structure will be in excess of 100 kilopascals.
BULK SAMPLE:	A large representative sample that has been taken from many tons of material.
BOREHOLE:	Any large diameter bored hole.
BOXHOLE:	A term used to describe short passages. Ore pass is used to label a passage that connects two levels. A drawpoint is the spot at which gravity-fed ore is loaded into hauling units.
BULLHORN:	A large steel pin shaped like a bull's horn that is placed in a drilled hole and used for hanging equipment or securing timber.
BULLHOSE:	A large air hose used when air-operated equipment needs a large volume of air.
BURDEN:	The measured space between a blast hole and the nearest open face, or the perpendicular distance between blast holes that, as the explosives are initiated, will become open faces. Sometimes the burden refers to the cubic measure or tons of material to be blasted.
BURLAP:	A strong, tightly woven jute, hemp, or cotton material used for straining tailings. The particles remain and the liquids escape. For underground use, a plastic material has replaced burlap.

BURN or SHATTER CUTS: A parallel pattern of drill-holes, usually 6" to 12" deep, used to develop a free face. One or more of the holes remain uncharged. Some of the uncharged holes are reamed to a larger diameter.

CABLE BOLTING: A method of reinforcing by cementing stranded cable in a drill hole.

CABLE LACING: A method of reinforcing rockburst-prone areas by placing cable over screen. In the event of a rockburst, the cables will reinforce the existing support system.

CACHE: An underground location where supplies are hidden or stored.

CAGE: A box-like enclosure used in a mine shaft to transport or convey men and materials to and from various working levels.

CAGE GUIDES: Fixed timber runners, fixed steel-tube runners, or wire rope used to track or guide a cage as it moves up or down a mineshaft.

CANOPY/HOOD:
1. A protective covering above the conveyance for protection of workers.
2. A covering on equipment to protect workers and equipment.

CAPS: Load-bearing horizontal plank or timber used in a two- or three-member timber set. Also a small cylinder that contains a detonating mixture and is linked to a fuse or electric current. Also see *detonator*.

CAPTAIN/MINE CAPTAIN: A line of management.

CAR OR MINE CAR: A wheeled carriage used to transport cargo or broken rock.

CASING: Tubing inserted into a drill hole to make the hole more stable.

CATCH PIT/FENCE: A construction of wood and filter material used to drain water, containing slimes, and sand spillage from a fill pour. In shaft sinking, also known as a catch basin.

CAVE OR CAVE-IN: The partial or complete collapse or failure of walls, backs, or rock pillars. A cave-in can be caused by the pressure exerted by the surrounding mass of rock.

CAVING: A mining method that involves breaking the ore by inducing a cave-in. There are variations of caving, including block caving, sub-level caving, top slicing, longwall, and room and pillar.

CENTRALIZER: A device used to line up a drill steel when collaring or starting drill holes.

CEMENTED ROCKFILL: A combination of broken rock and cement that is used to backfill underground openings. The fill supports the walls of the opening or provides a working floor.

CEMENTED TAILINGS FILL: A combination of finely ground waste rock and cement that is used to backfill underground openings. The fill supports the walls of the opening or provides a working floor.

CHAIR(S): Movable supports used for the cage or used to support the cage at the correct elevation.

CHANGE HOUSE: A mine building that mining personnel use to change into and out of their working clothes. Also called a dry.

CHARGE:
1. An explosive and a detonator.
2. An explosive, a detonator, and a primer that is exploded as a single unit.

CHARGING STATION: An underground room or chamber used specifically for charging and exchanging locomotive batteries. Also called a charging room.

CRIB: A square or rectangular pillar constructed of timbers that have been laid in alternating cross layers. A crib is created to support the back. The centre of the pillar might be filled with waste or rock.

CHUTE/MILLHOLE/ ORE PASS:	A steeply inclined passage used to move ore from one elevation to a lower elevation. The term chute is used to identify the ore passage and the control position situated at the bottom of the passage. The term millhole is used to define the constructed portion of the passage above the headblock (timber or steel across the chute opening).
CHUTE:	A device used to direct/control the flow of material elevation.
CLAIM:	An area or portion of land a person has defined by stakes. To hold mineral rights for the claim, it must be reported to the appropriate government office.
CLAM:	Mechanical equipment used for mucking in shaft sinking operations.
CLEAT:	A piece of wood nailed to a timber or other structure intended as support.
COLLAR:	1. The timbering or concrete around the shaft. 2. The start of a drill hole.
COLLARING:	1. The process of beginning the drilling of a hole. 2. The process of beginning an excavation of a mineshaft.
COME-ALONG:	A hand-operated ratchet block-lifting device.
COMPARTMENT:	A shaft division formed by dividers.
CONCURRENT BACKFILLING:	Placing backfill into an underground opening immediately after the ore or rock has been moved.
CONVEYOR BELT:	A mechanical device, usually a electrically driven belt, which extends from a receiving point to a discharge point and conveys material between those two points.
CORE:	Cylindrical-shaped section of minerals or rock that has been extracted or recovered by diamond drilling. A core reveals the various strata of the area.

CORE BOXES:	Lidded containers designed to hold core in parallel grooves.
CROSSCUT:	A horizontal underground tunnel driven perpendicular or at an angle to the strike. Also called a travel way.
CROSSHEAD:	A guiding device that prevents a bucket from swaying as it is being lowered into a shaft.
CROWN PILLAR:	A horizontal plug or neck of rock left above a mined-out area for support.
CRUSHER:	A machine used to reduce the size of ore/waste by crushing.
CUT:	A term used to describe the location and direction of holes that are blasted in order to provide a free face to which other holes are blasted. A cut is also a slice or lift taken during stoping operations.
CUTOFF or CUTOFF HOLE:	A portion of a charged hole that has been broken or isolated as the result of ground movement.
DEADMAN:	A buried log, concrete structure, or object that functions as an anchor. A deadman is also a block used on an incline to guard against runaway cars.
DECANTATION:	The separation of a liquid from sediment by taking the liquid out without disturbing the sediment.
DECK:	One of the separate platforms or divisions of a cage. Also, sometimes the top level of the shaft is called the deck.
DELAY DETONATOR:	A detonation device that initiates a delayed explosion after a predetermined period.
DETONATE:	To cause an explosive agent or mixture to explode.
DETONATOR:	A device used in firing a charge of explosive; includes blasting cap and electric blasting cap.
DEVELOPMENT:	The initial work required to open up or access a mineral deposit, including sinking a shaft and creating drifts, crosscuts, and raises.

DIAMOND CUT/ PYRAMID CUT: A converging pattern of drill holes expected to break a pyramid-shaped volume of rock.

DIAMOND DRILL: A rotary type of rock drill using diamond cutting bit.

DIP: The angle at which a vein, structure or rock bed is inclined from the horizontal and is measured at right angles to the strike.

DISKING: A condition of a drill core sample that indicates an area is under high stress. When the rock sample contains many thin slices or disks, the area is under considerable stress.

DISPLACEMENT: A term referring to changes from one side of a fracture plane relative to the other side of the plane.

DIVIDERS: Cross-steel or timber members in a shaft that divide it into compartments and that may support brattice, guides, and so on.

DOGS: Mechanical safety devices, used in shaft conveyances, that automatically grab the guides in the shaft in case of rope failure.

DOLLY: A drill attachment used for the installation of ground control systems (e.g., rock bolt, rebar, split set, and swelled.

DOWNCAST: The movement of air downward in a mine.

DRAW POINT: A funnel-shaped opening at the bottom of a stope.

DRIFT: A horizontal underground opening originally parallel to the strike of an ore body.

DRILL (noun): Any cutting tool that uses energy to produce a circular hole in rock, metal, wood, or other materials.

DRILL AUGER: A drill rod, with an external spiral that expels cuttings from drill holes.

DRILL BIT: One of a number of cutting tools used to cut circular holes in rock, wood, and metal.

DRILL HOLE: A drilled hole in which rock bolts, explosives charges, or blasting agents are placed. Also referred to as a *blast hole*.

DRILL STRING: The assemblage in a drill hole, consisting of drill rods, core barrel and bit, or drill rods and bit, that is connected to and rotated by the drill at the collar of the bore hole.

DRIVE/DRIVING: The process of excavating underground passages. In some mining communities, the terms are reserved for the creating of horizontal passages.

DRUM HOIST: A large, power-driven cylinder or cone on which a rope is coiled to hoist and lower materials and/or personnel.

DRUMMY: A scaling term describing the sound that is emitted when loose rock is struck by a steel bar or hammer. The muffled sound is similar to that of a drum being struck.

DYKE: A long, relatively thin body of igneous rock.

EASERS/EASER HOLES: Holes drilled to lighten the burden in a drill pattern. Also called helper holes.

ELECTRO-MAGNETIC TEST: Test using electromagnetic equipment to determine the condition of mine hoist ropes and to identify and locate problems.

EMERGENCY PULL CORD: A rope or line by which a machine or conveyor can be stopped from a remote location.

END PLATES: Horizontal shaft timber components, normally the shortest member in a rectangular shaft.

ESCAPE WAY/ EMERGENCY MANWAY: An opening through which persons may leave the mine or workplace if the normal exit is obstructed.

EXPLORE: To prospect or search for ore.

EXPLOSIVES: A substance that is made, manufactured, or used to produce an explosion or detonation and includes gunpowder, propellant powder, dynamite, detonating cord, blasting agent, slurry, water, gel, and detonator.

EYEBOLT: A rod or bolt having a looped or ring-shaped opening at one end.

FACE: Any part of a mine where rock is being worked, such as a drift, crosscut, or stope. In a stope, the face is commonly called the breast if the holes are being drilled horizontally. Most commonly, the end of a drift or stope where work is being carried out is called the face.

FAILURE ZONE: The area or portion of rock, around an opening, that is subject to collapse or movement.

FALL-ARREST SYSTEM: A suitable combination of a belt a full body harness, a lanyard, an anchor, and a rope-grabbing device or lifeline.

FALL OF GROUND: Rock that falls from the roof or wall as a result of gravity.

FAULTS: A fracture or fracture zone along which there has been a clearly visible dislocation or displacement of the two sides, relative to each other.

FAULTING: The moving or shifting that results in the displacement of adjacent rock masses along a break or fracture.

FINE(S): Tiny particles of crushed rock or ore that are smaller than a specified screen size.

FIRE-HAZARD AREA:

1. An area in which a fire hazard may be created by smoking, matches, or other means of producing heat or fire and that has been designated as such by the supervisor in charge of the mine.
2. A storage area where oil, grease, or flammable liquids in excess of 500 litres are stored.

FIRE-SUPPRESSION SYSTEM: An installation for the specific purpose of controlling a fire in a particular place or piece of equipment.

FIRING: The act of detonating an explosive charge.

FISH PLATES: Specially shaped steel plates used to join the end of one rail to the next in the track.

FLOOR:	The level working area in a stope, or the flat underlying layer of ore. When the footwall is the floor, the hard surface in the flat-lying seams is also considered to be the floor.
FOLDING:	The bending of rock strata that results in geologic structures, such as anticlines, synclines, monoclines, and isoclines.
FOOTWALL:	The lower wall of any mine opening.
FRACTURE:	A clean break or crack in ore or rock.
FRACTURE ZONE:	A mass or area of rock that has many small, irregular fractures.
FRAGMENTATION:	The process of blasting ore or rock into pieces that are small enough to be easily handled or moved.
FREE FACE:	An open side or area of rock that a charged hole can break.
FRICTION HOIST (KOEPE):	A mine hoist in which conveyances are suspended from both sides of a simple friction pulley, which imparts a desired motion. It is distinct from a drum hoist, in which case the ropes are wound on individual drums.
FROG:	The centrepiece of a track switch.
FROZEN CUT:	The first holes blasted in a development round that do not break the rock as intended but shatter and cover over with no explosives visible.
GAD:	An iron or steel wedge-shaped tool used to break loose rock or ore that is difficult to scale down.
GALVANOMETER:	An instrument used to detect small electric current. In electric blasting it is used to determine if there are broken wires or short circuits
GANGWAY:	An elevated travel way in a drift, usually of timber construction, used to provide access to pull chutes.
GAUGE RODS:	A device for stabilizing the distance between the rails.

GRIZZLY: A series of bars, rails, or other members used to control the size of material passing into an ore/waste pass.

GROUND FAULT SYSTEM: A sensing device used in electrical circuits that interrupts the power supply when electrical current leaks to ground.

GROUNDING CHAIN: A sensing device used on rubber-tired vehicles to ground shorts and static electricity.

GUARD:
1. A fixture or attachment used to guard against injury.
2. A person placed to prevent access to a blast.

HANGING RODS: Fabricated metal rods used to hang the components of shaft timber (dividers, wall and end plates) and timber in place.

HEADBLOCK: A length of timber or steel forming the top part of a chute opening.

HEADER: A large pipe or chamber with several tees or nozzles connected to consuming points (or areas in which either water or air is required). A header maintains water pressure and allows water to advance as required.

HEADFRAME: An arrangement of control valves at the end of a pipe. The steel, timber, or concrete frame that supports the hoisting sheaves (grooved or groove-rimmed wheels) over the mineshaft.

HEADING: Workplace in an underground mine.

HITCH: A notch, step, or hole cut in a rock in order to support or hold timber or steel posts, beams, or stalls.

HOIST (verb): To raise or lower materials or personnel.

HOOD: A removable, protective cover used over conveyances for shaft inspection.

HUNG LOAD: Any load of materials that is suspended.

HYDRAULIC BACKFILL: Waste material that has been both transported and flushed into place through the use of water.

IGNITER CORD: A small-diameter cord made of combustible material `and used to ignite a safety fuse or a series of safety fuses. The igniter cord is designed so that its flame burns at an even rate.

JACKLEG: A handheld, pneumatic, percussion drill with a hand-controlled pneumatic extension leg.

JIM CROW: A portable tool used to bend iron rails.

JOINTS: Rock fractures that run parallel to a plane or surface and that show little or no visible movement or displacement.

JUMBO OR JUMBO DRILL: A drill carriage on tracks, rails, or tires and with one or more booms or arms that support the drilling machinery.

LAGGING:
1. Timber placed under the roof of a stope or drift to catch small pieces of rock rather than support the main weight of overlying rocks.
2. Round timber in various sizes and lengths used underground for staging.

LEACH OR LEACHING: The natural process of dissolving minerals from rock or ore by draining liquids downward or allowing them to percolate. Also, leaching is a chemical process used to extract valuable minerals from ore.

LEVEL: A horizontal or nearly horizontal plane of interconnected mining areas.

LIFELINE(S): The part in a fall-arrest system that runs from the anchor to the personal safety belt or body harness.

LIFTERS: Bottom holes in a drift round/raise round slash.

LOADING POCKET: An excavated storage area in the shaft where rock is transferred from o.p./w.p. to skip conveyances.

LOAD HAUL DUMP (LHD): A machine powered by electricity, diesel, or compressed air that loads, hauls, and dumps ore.

LOCKOUT AND/OR TAG:	Safety procedures device used to prevent the activating or energizing of equipment.
LOOSE ROCK:	Fragmented or weak rock that needs to be taken down. Also referred to as loose.
LUX:	A unit of measurement by which light intensity is measured.
MANWAY:	Any passage normally used for travel from one elevation to another.
MAGAZINE:	On surface, a specially constructed room or building used for the storage of explosives. Underground, a specially prepared and designated area for storing explosives.
MECHANICAL SCALER:	A machine used to remove loose from an opening, usually by a hammering process.
MICROSEISMIC MONITORING:	Using an electronic device to measure subaudible stress noises or changes that occur in the rock. The readings taken by a microseismic monitor can be used as indicators of rock failure.
MILLHOLE:	An opening for the passage of muck.
MISHOLE:	A drill hole that contains explosives in which all or part of the explosives has failed to detonate.
MUCK (noun):	Rock that has been broken by blasting.
MUCK (verb):	To shovel or load any material.
NIPPING:	Movement of material.
OLD CUTS:	The remnant of a blasted cut.
OPEN HOLE:	Any unprotected hole through which a person could fall or enter.

OPEN STOPING:	The removal of the entire ore body without leaving any pillars.
OPERATING MINE:	An underground hard rock mine in which production, development, and changing conditions require maintenance and installation of infrastructure, ground control, and ventilation for the extraction of ore. It is where a worker can demonstrate terminal performance objectives as outlined in a specific module.
ORE:	Mixtures of minerals and waste rock from which at least one mineral can be mined for profit.
ORE PASS:	An opening to accommodate the movement of broken muck.
OVERBREAK:	When rock breaks past the design of the blast.
OVERWIND:	The act of hoisting (or winding up) a cage or skip beyond its safe limits.
PANELS:	A group of working places, usually operated as a unit, separated by large pillars.
PERCOLATION:	The process of allowing a liquid to seep through a solid.
PILOT HOLE:	A small-diameter hole used to guide or direct a reamer.
PIN SETS:	The base of a structure formed by drilling pinholes in the wall and installing steel pins that support a saddle block for the support of base timbers on beams.
PILLAR:	The engineered support at any opening being excavated in a mine.
PINCH POINTS:	Any point on a machine or piece of equipment where movement may cause pinching.
POLE BLASTING:	Blasting a box hole or chute using a charge tied to a pole.
PONY SET:	A small timber set incorporated into the main timber set as additional reinforcement.

POPPING:	The snapping noise heard in the vicinity of recently blasted openings or in highly stressed areas. Popping is sometimes referred to as *spalling*.
PORTAL:	The surface opening to a shaft, tunnel, or adit.
POST:	A timber placed in an upright position and used as a support prop.
POST PILLARS:	Very slender pillars used in conjunction with backfill to support the rock.
POWDER:	An often used term for explosives or blasting agents.
PREMATURE BLAST:	The detonation of an explosive charge earlier than planned. Also referred to as premature firing.
PRIMER:	A small charge placed within the main charge to initiate an explosion.
RAISE:	A vertical or inclined underground opening.
RAMP:	An inclined roadway.
REAM:	To enlarge a drill hole by re-drilling with a special bit.
REFUGE STATION:	An underground area that can be sealed off and used by miners as a refuge against fires and their effects. See regulation 26 of the *Occupational Health and Safety Act.*
RESIN BOLTING:	A method of roof bolting that involves anchoring the bolt in resin.
ROCK BOLTING:	A manual or mechanized method of securing the back, roof, and walls.
ROCKBURST:	A sudden failure of rock.
ROCK MECHANICS:	The study and mathematical analysis of the behaviour of rock, focusing on the forces that affect rock along planes and faults and around excavations.

ROOM AND PILLAR:	A mining method that involves excavating rooms and leaving pillars. This method is often used when the ore is present in a flat seam.
ROTARY DRILL:	A drill that bores or cuts a hole as the drill bit rotates.
ROTARY PERCUSSION DRILL:	A drill that repeatedly strikes the rock surface as it is boring or cutting a hole.
ROUND:	A drill pattern drilled and charged to a predetermined depth to excavate.
RUN LIGHT:	A light that indicates the operational status of equipment.
SAFETY BAY (STATION):	An enlargement in a haulage drift for the safety of people when haulage equipment is being met.
SAFETY FUSE:	A prepared cord, made of combustible materials, used to ignite a detonator or an explosive charge.
SANDBLASTING:	Blasting chunks using a charge set on top of a rock to reduce the size.
SCALING:	Checking, conditioning, and removing loose rock from roofs, walls, and faces.
SCALING BAR:	A shaft or rod (with a forged or replaceable tip) that is used to pry loose rock from the face, back, and walls.
SCRAPER:	Used in conjunction with a slusher to move broken rock.
SCRUBBER:	An exhaust cleaner on a diesel engine.
SECURE GROUND:	Make ground safe from falls (e.g., by scaling, bolting, timbering).
SHAFT SINKING:	Excavating a shaft downward, usually from the surface, to gain access to an ore body.

SHEAR:	When structural pressures cause a plane to fracture, resulting in the shifting or displacing of one side of the plane in relation to the other side of the plane.
SHOTCRETING:	Pneumatically applied cement mortar, or shotcrete, to prevent decay and provide support on surface of roofs and walls.
SISSOR TRUCK (LIFT):	A service vehicle used to lift people to another elevation of ground by using ground control and support methods.
SILICOSIS:	A lung disorder caused by the inhalation of silica or quartz.
SILL:	The floor or bottom member of a timber set. Also, sill refers to the floor of a seam or the bottom floor of a stope.
SINK:	The process or act of excavating a shaft or a slope.
SKIDS:	Planks, logs, or beams along which heavy objects can be slid or moved.
SKIP:	Self-dumping type of conveyance in a shaft for hoisting ore/rock.
SKIP DUMP:	The top of the skip compartment in which ore is hoisted from the mine and dumped into an ore/waste bin.
SKIP SCROLL:	The track at a skip dump that guides the skip to the dumping position.
SLASH:	The act of drilling and blasting ore from the sides of a passage or stope in order to make the opening wider.
SLIMES:	Extremely fine particles of rock suspended in water.
SLINGS:	Rigging or lifting device used to raise or lower objects.
SLUDGE:	The fine cuttings and water that come from a hole being drilled.
SLUSHER:	A multi-drum device used in conjunction with a scraper to move broken rock.

SLUSHER BLOCK: A pulley used in slusher operation.

SOUNDING: Striking or tapping the back and walls of the workplace of a mine using the end of a scaling bar to check for loose rock.

SPACING: A blasting term that refers to the distance between boreholes.

SPALLING: The breaking off or flaking of thin layers of rock. Spalling indicates that the stress levels in the rock are increasing. Also called *popping* and *spitting*.

SPITTING: The high-velocity ejection of small fragments of rock that occurs when a rock mass under stress breaks. Sometimes spitting is also called *spalling*.

SPOT: The act of placing an object into position (e.g., a car can be spotted under a chute so that the car can be loaded).

STAGING: A working platform.

STATION OR SHAFT STATION: An area of the shaft that has been enlarged so it can be used as a landing for the cage. All mining levels will have a landing.

STEMMING: Clay, sand, slag, drill cuttings, gravel, or water that is placed in a borehole to plug the hole and hold the explosive charge in place. Stemming might also be used to separate explosives within the length of a borehole.

STENCH GAS: A substance with a distinctive, disagreeable odour, similar to rotten eggs, put into the ventilation and compressed-air systems to warn underground workers of fire or other emergencies.

STOCKPILE: An accumulation or reserve pile of broken ore.

STOPE: An excavation in a mine where ore is extracted.

STOPER: A pneumatic drill with a telescopic leg primarily used in raise mining for drilling upholes and bolting the backs of drifts and stopes.

STRESS:	A load or force (mathematically calculated or measured) that is producing a strain on rock, wood, steel, backfill, or other materials.
STRIKE (of a bed):	The intersection of an inclined vein or seam with a horizontal plane. A strike's direction is always at right angles to the tip.
STRINGER:	A narrow vein or veinlet of ore. Also, a stringer is a timber or beam connecting two upright timbers or posts.
STULLS:	Large timbers that have been wedged into place between two stope walls and that serve as a platform or protective cover.
SULPHIDE BLAST:	A sulphide rock dust explosion caused by igniting the sulphide dust, which is present in the workplace, resulting in significant damage to mine openings.
SUMP:	A catch basin, usually at the bottom of a shaft but also found in other areas of the mine, where damage is collected and then pumped.
SWITCH BAR:	A component of a track switch throw that joins the points together.
TAILINGS:	The refuse, waste, sediment, or tail product that has been left behind after an ore has been processed.
TEARING DOWN:	The dismantling of a rig or drilling equipment so that the area can be blasted or the equipment set up in another site.
TIMBER DOG:	A piece of steel used to hold two timbers together.
TIPPLE OPERATION:	The unloading of cars caused by sideways tipping.
TOE:	The bottom section or portion of a drill hole.
TRACK GAGE/ GAUGE:	The measurement of the distance between the inner edges of railway rails. The term also refers to the diameter of drill bits.
TRAILING CABLE:	An electric cable extending from mobile equipment to power source.
TRAIN:	A connected string of cars that is usually powered by a motor.

TRAVEL WAY:	A passage for personnel, equipment, muck, and supplies in a mine.
TROLLEY OR TROLLEY LOCOMOTIVE:	A car that travels on a track, or an electric haulage motor that receives its electricity from an overhead trolley wire.
TUGGER:	A small hoist used to move equipment and supplies.
TUNGSTEN-CARBIDE:	A hard, highly abrasive material used in the cutting edges of drill bits.
TURNTABLE:	A revolving platform used to turn mine cars and locomotives 180 degrees.
UNDERCUT AND FILL MINING:	A mining method that involves creating a working floor with backfill following each production blast.
UPPER:	A hole drilled upwards to be blasted.
VEHICLE SISSOR LIFT TRACK:	A service vehicle used to elevate personnel and/or material to a desired location to work.
VEIN:	A rock fissure, crack, or fracture that is filled with mineralized material.
VENTILATION:	Method of supplying respirable air to workplace in a mine and of exhausting contaminated air.
VENTILATION DUCTING OR TUBING:	Plastic or sheet-steel piping used to channel air to or from a workplace.
VERTICAL CRATER RETREAT:	A bulk mining method that utilizes large-diameter holes. Also referred to as retreat mining. In vertical crater retreat mining, successive cuts are carried out remotely by blasting and cratering the bottom of the drill holes. The ore body is mined from the bottom up.

WALL PLATE:	The longest piece of timber in a set of shaft timbers that fit horizontally in a shaft.
WASTE:	1. Rock that has no mineral value. 2. Refuse material.
WASTE PASS:	An opening to accommodate the movement of broken rock.
WAGON DRILL:	A light wagon, similar to a jumbo, that carries one or more mounted rock drills.
WEDGE:	A piece of wood or metal having two principal faces that meet to form a sharp wedge.
WEDGE BLOCKS:	Rock that is bound by intersecting joint or fault planes and has a tendency to fall unless supported (by rock bolts, pillars, or screen).
WHEEL CHOCK:	Wedge-shaped piece of material used to prevent mobile equipment from rolling.
WHIP CHECK:	Cables attached to hoses and equipment to retard backlash in the event of disconnection under pressure.
WINZE:	A shaft that is collared underground.
WIRE MESH:	A ground support mesh, screen, or fencing that works with rock bolts to contain small pieces of rock, preventing them from falling in between the bolting pattern. Wire mesh or screen acts as a stabilizing force when attached to a rock surface.
WORK or WORKING:	The process of mining. Also refer to the shifting, moving, or squeezing of rock.
WORKINGS:	Underground excavations from which ore is being extracted (or has been extracted).